

KEY

 Rainfall

 Interception Losses (Evapotranspiration / Infiltration)

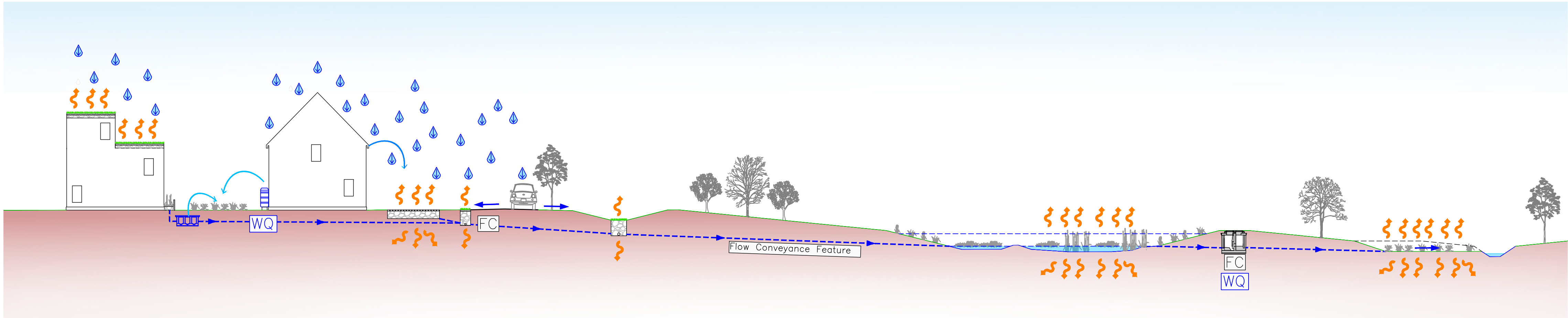
 Water Reuse

 Water Quality Device (Oil Separator / Vortex Separator)

 Flow Control Device (Orifice / Vortex Flow Control)

 Overland Flow

 Surface Water Sewer (connecting SuDS Features)



DEVELOPMENT TYPE	Commercial / Public	Residential	Private / Shared Parking	Public Highway	Conveyance Features		Green Infrastructure / Public Open Space	Watercourse Corridor
MANAGEMENT TRAIN	PREVENTION SOURCE CONTROL SITE / REGIONAL CONTROL							
SuDS FEATURE	Rainwater Harvesting (Reuse for irrigation e.g Rainwater Butts) Green Roofs Bioretention Areas / Rain Gardens Rills	Rainwater Harvesting (Reuse for irrigation e.g Rainwater Butts) Porous Paving Tanks Flow Control Devices		Swales Bioretention Areas Filter Strips Filter Drains			Strategic SuDS incorporating sediment forbays, wetland areas, micropools at the outlet Flow Control Devices Water Quality Devices	Outfall Swale
MAINTENANCE RESPONSIBILITY	Commercial or Public Tenants	Homeowners	Homeowners / Management Company	Highway Authority	Southern Water / Management Company		Southern Water / Management Company	Southern Water / Management Company



Stratton Park House, Wanborough Road
Swindon, SN3 4HG

Telephone
01793 828000

Website
www.pfaplc.com

For Planning
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

NOTES

- Drawing to be read in conjunction with Flood Risk Assessment and Water Management Strategy produced by PFA Consulting (Document Ref: G277-DOC01 Dated November 2020) and Preliminary Water Management Strategy Plan (Drawing No. G277/21 & 22).
- Future design of upstream Source Control & Site Control to take account of the principles established in the Water Management Strategy and this drawing.

Rev	Date	Description	Drawn	Check
#	26.11.20	First Issue.	BF	MWS

Status
FOR PLANNING

Client
Eastleigh Borough Council

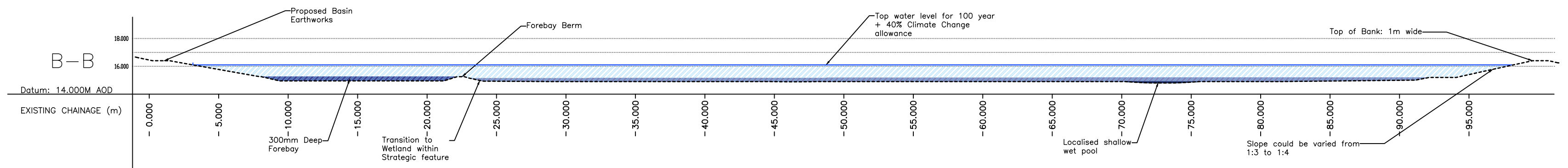
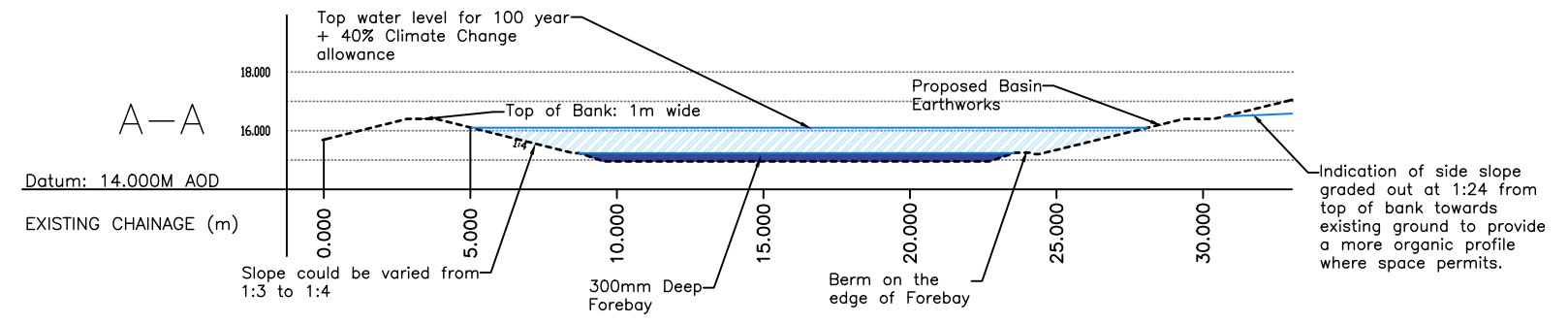
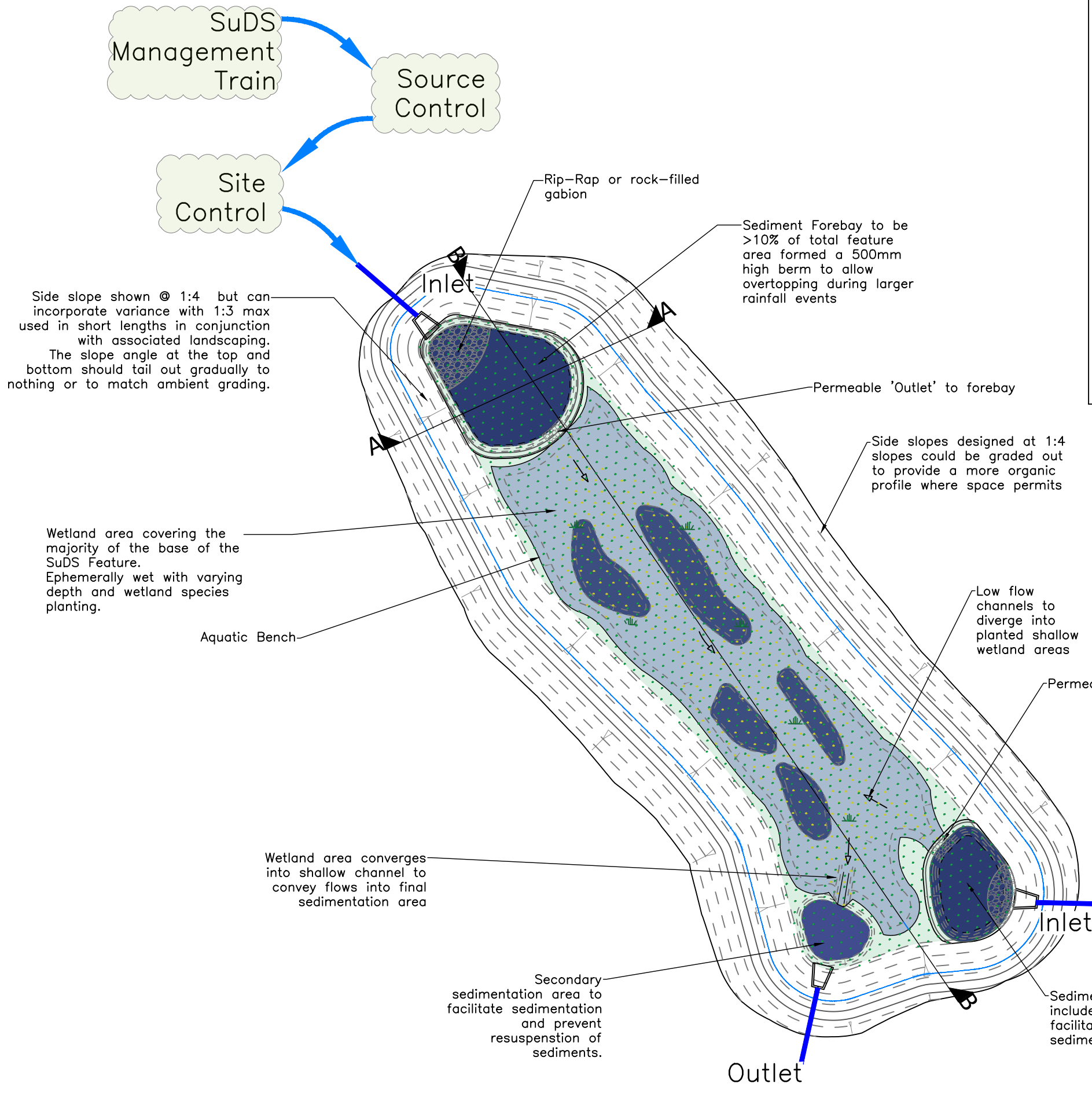
Project
**One Horton Heath
Hampshire**

Drawing Title
SuDS Management Train

Drawing No. **G277/24**

Date: November 2020
Scale: NTS @ A1
E-Mail: bfox@pfaplc.com

Appendix 8



PFA
consulting

Stratton Park House, Wanborough Road
Swindon, SN3 4HG

Telephone
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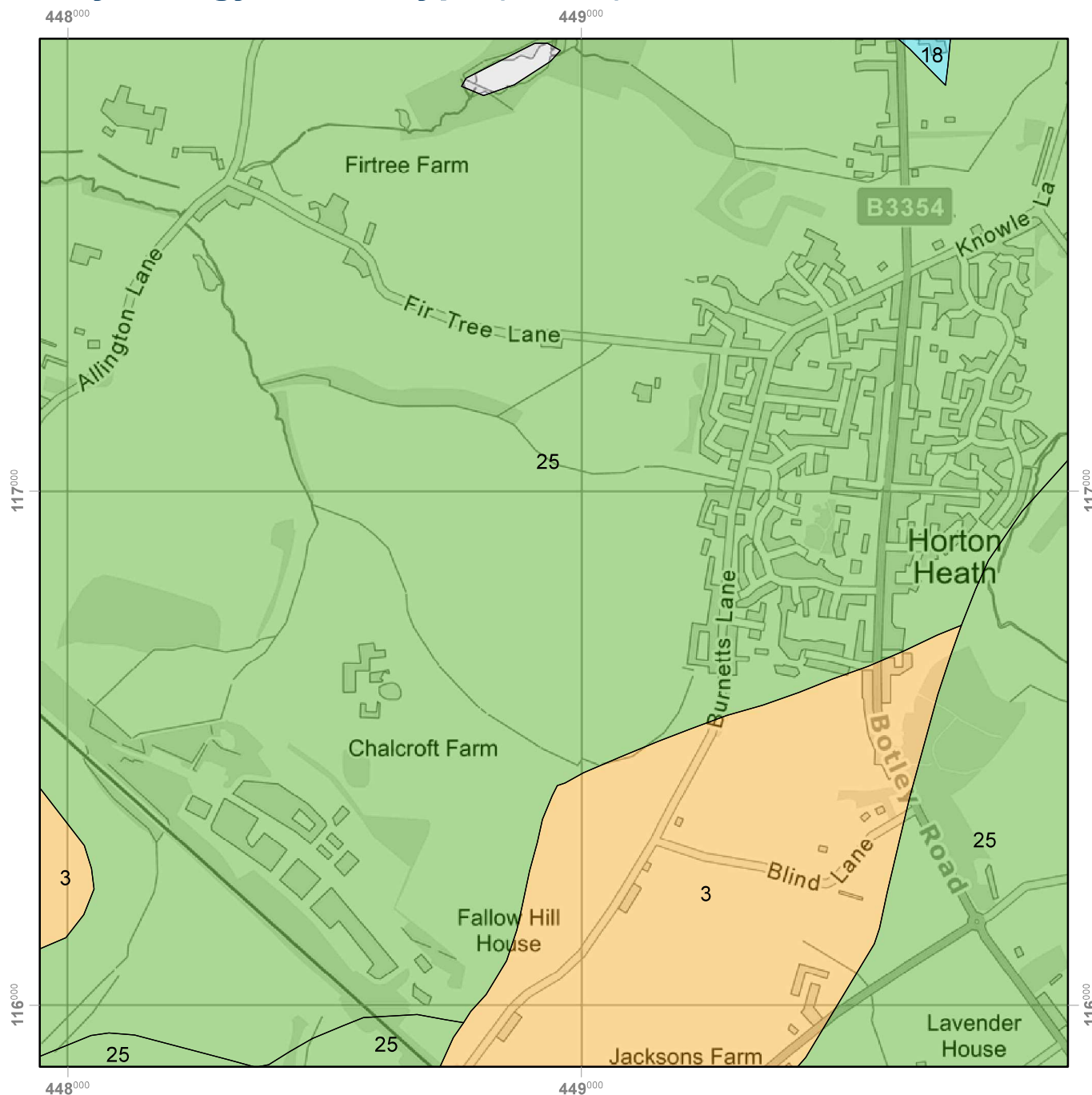
Website
www.pfapl.com

For Planning
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

- NOTES**
1. This drawing shows the typical SuDS feature arrangements for the SuDS features shown on the Preliminary Water Management Strategy Plan, Drawing number G277/21 & G277/22.
 2. Upstream SuDS management train principles are outlined in the PFA's Water Management Strategy and depicted on drawing G277/24 dated November 2020.

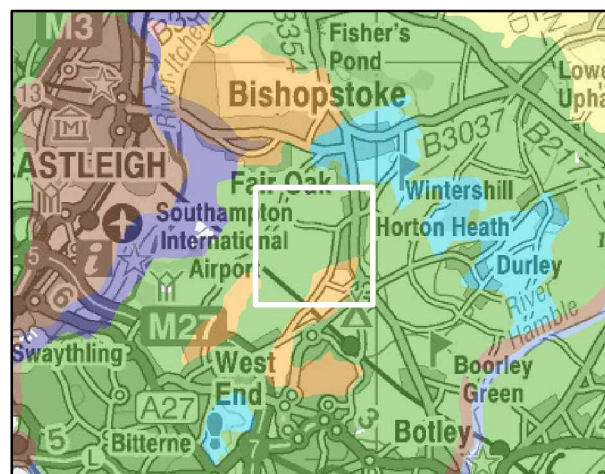
Rev	Date	Description	Drawn	Check
#	26/11/20	First Issue.	DAB	SAM
Status				
FOR PLANNING				
Client				
Eastleigh Borough Council				
Project				
One Horton Heath Hampshire				
Drawing Title				
Typical Layout of Strategic SuDS Features to Inform Detailed Design				
Drawing No.				
G277/23				
Date: November 2020		Scale: As shown		
E-Mail: DBuciak@pfaplc.com				

1b Hydrology of Soil Type (HOST)



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and for the Controller of HMSO 2018

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Hydrology of Soil Type (HOST) Key



3 Free draining permeable soils on soft sandstone substrates with relatively high permeability and high storage capacity



18 Slowly permeable soils with slight seasonal waterlogging and moderate storage capacity over slowly permeable substrates with negligible storage



25 Slowly permeable, seasonally waterlogged soils over impermeable clay substrates with no storage capacity

HOST CLASS DESCRIPTION

The Hydrology of Soil Types (HOST) classification describes the dominant pathways of water movement through the soil and, where appropriate, the underlying substrate. Eleven drainage models are defined according to the permeability of the soil and its substrate and the depth to a groundwater table, where one is present (Boorman et al, 1995). These are further subdivided into 29 HOST classes to which all soil series have been assigned. These classes identify the way soil water flows are partitioned, with water passing over, laterally through, or vertically down the soil column. Analysis of the river hydrograph and the extent of soil series for several hundred gauged catchments allowed mean values for catchment hydrological variables to be identified for each HOST class. The HOST classification is widely used to predict river flows and the frequency and severity of flood events and also to model the behaviour of diffuse pollutants (Hollis et al, 1995).

Calculated by:	Philipp Schilbach
Site name:	Land at Horton Heath
Site location:	Eastleigh, Hampshire

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	50.95332° N
Longitude:	1.30842° W
Reference:	1237022321
Date:	Oct 22 2019 14:24

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha):	1
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Methodology

Q _{MED} estimation method:	Calculate from BFI and SAAR
BFI and SPR method:	Calculate from dominant HOST
HOST class:	25
BFI / BFIHOST:	0.17
Q _{MED} (l/s):	8.1
Q _{BAR} / Q _{MED} factor:	1.14

Hydrological characteristics

	Default	Edited
SAAR (mm):	800	800
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is $Q_{\text{BAR}} < 2.0 \text{ l/s/ha}$?

When Q_{BAR} is $< 2.0 \text{ l/s/ha}$ then limiting discharge rates are set at 2.0 l/s/ha .

(2) Are flow rates $< 5.0 \text{ l/s}$?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $\text{SPR}/\text{SPRHOST} \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	9.2	9.2
1 in 1 year (l/s):	7.82	7.82
1 in 30 years (l/s):	21.17	21.17
1 in 100 year (l/s):	29.36	29.36
1 in 200 years (l/s):	34.42	34.42

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature A 1 year runoff			
Date 07/12/2020 10:55 File BASIN A.SRCX		Designed by DAB Checked by			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	15.612	0.112	8.1	82.5	O K
30 min Summer	15.641	0.141	11.7	104.9	O K
60 min Summer	15.667	0.167	14.7	125.1	O K
120 min Summer	15.687	0.187	16.6	140.7	O K
180 min Summer	15.696	0.196	17.5	148.3	O K
240 min Summer	15.701	0.201	17.6	152.1	O K
360 min Summer	15.701	0.201	17.6	152.2	O K
480 min Summer	15.697	0.197	17.5	149.1	O K
600 min Summer	15.692	0.192	17.1	145.1	O K
720 min Summer	15.687	0.187	16.6	140.7	O K
960 min Summer	15.676	0.176	15.6	132.4	O K
1440 min Summer	15.659	0.159	13.8	118.8	O K
2160 min Summer	15.641	0.141	11.7	104.7	O K
2880 min Summer	15.629	0.129	10.2	95.1	O K
4320 min Summer	15.613	0.113	8.2	82.6	O K
5760 min Summer	15.602	0.102	6.9	74.6	O K
7200 min Summer	15.594	0.094	6.0	68.9	O K
8640 min Summer	15.588	0.088	5.4	64.4	O K
10080 min Summer	15.584	0.084	4.9	60.8	O K
15 min Winter	15.625	0.125	9.7	92.1	O K
30 min Winter	15.657	0.157	13.6	117.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	80.6	25	
30 min Summer	19.618	0.0	109.3	37	
60 min Summer	12.728	0.0	147.5	60	
120 min Summer	8.110	0.0	188.9	92	
180 min Summer	6.206	0.0	217.3	126	
240 min Summer	5.126	0.0	239.7	160	
360 min Summer	3.877	0.0	272.3	228	
480 min Summer	3.179	0.0	297.9	292	
600 min Summer	2.725	0.0	319.4	356	
720 min Summer	2.403	0.0	338.1	420	
960 min Summer	1.972	0.0	369.8	544	
1440 min Summer	1.492	0.0	419.4	786	
2160 min Summer	1.128	0.0	479.6	1152	
2880 min Summer	0.925	0.0	524.1	1508	
4320 min Summer	0.700	0.0	593.1	2248	
5760 min Summer	0.575	0.0	654.0	2952	
7200 min Summer	0.492	0.0	699.9	3680	
8640 min Summer	0.433	0.0	738.2	4416	
10080 min Summer	0.389	0.0	771.0	5144	
15 min Winter	29.494	0.0	91.0	24	
30 min Winter	19.618	0.0	123.2	36	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature A 1 year runoff			
Date 07/12/2020 10:55 File BASIN A.SRCX		Designed by DAB Checked by			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	15.686	0.186	16.5	140.2	O K
120 min Winter	15.707	0.207	17.7	156.6	O K
180 min Winter	15.715	0.215	17.8	163.2	O K
240 min Winter	15.717	0.217	17.8	164.8	O K
360 min Winter	15.710	0.210	17.7	159.6	O K
480 min Winter	15.700	0.200	17.6	151.6	O K
600 min Winter	15.691	0.191	17.0	144.1	O K
720 min Winter	15.682	0.182	16.2	137.1	O K
960 min Winter	15.667	0.167	14.7	125.2	O K
1440 min Winter	15.646	0.146	12.3	108.4	O K
2160 min Winter	15.626	0.126	9.8	92.9	O K
2880 min Winter	15.613	0.113	8.3	83.1	O K
4320 min Winter	15.597	0.097	6.4	71.0	O K
5760 min Winter	15.587	0.087	5.3	63.7	O K
7200 min Winter	15.580	0.080	4.5	58.4	O K
8640 min Winter	15.575	0.075	4.0	54.4	O K
10080 min Winter	15.571	0.071	3.6	51.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	12.728	0.0	165.7	60	
120 min Winter	8.110	0.0	212.0	98	
180 min Winter	6.206	0.0	243.8	136	
240 min Winter	5.126	0.0	268.9	174	
360 min Winter	3.877	0.0	305.4	244	
480 min Winter	3.179	0.0	334.1	310	
600 min Winter	2.725	0.0	358.2	374	
720 min Winter	2.403	0.0	379.2	438	
960 min Winter	1.972	0.0	414.8	564	
1440 min Winter	1.492	0.0	470.4	808	
2160 min Winter	1.128	0.0	537.5	1172	
2880 min Winter	0.925	0.0	587.4	1532	
4320 min Winter	0.700	0.0	665.0	2256	
5760 min Winter	0.575	0.0	732.7	3000	
7200 min Winter	0.492	0.0	784.2	3744	
8640 min Winter	0.433	0.0	827.2	4408	
10080 min Winter	0.389	0.0	864.4	5152	
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Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature A 1 year runoff	
Date 07/12/2020 10:55 File BASIN A.SRCX	Designed by DAB Checked by	
XP Solutions Source Control 2019.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.584

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
	(ha)		(ha)		(ha)
0	4 0.500	4	8 0.500	8	12 0.584

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Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature A 1 year runoff	
Date 07/12/2020 10:55 File BASIN A.SRCX	Designed by DAB Checked by	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 16.700

Tank or Pond Structure

Invert Level (m) 15.500

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	706.6	0.401	912.5	0.801	1134.6	1.200	1372.1
0.101	756.5	0.501	966.6	0.901	1192.6		
0.201	807.5	0.601	1021.6	1.001	1251.7		
0.301	859.5	0.701	1077.6	1.101	1311.7		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0192-1830-0900-1830
Design Head (m)	0.900
Design Flow (l/s)	18.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	192
Invert Level (m)	15.500
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	18.3
Flush-Flo™	0.319	18.3
Kick-Flo®	0.658	15.8
Mean Flow over Head Range	-	15.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.7	1.200	21.0	3.000	32.5	7.000	49.0
0.200	17.6	1.400	22.6	3.500	35.0	7.500	50.7
0.300	18.2	1.600	24.1	4.000	37.4	8.000	52.3
0.400	18.1	1.800	25.5	4.500	39.6	8.500	53.9
0.500	17.7	2.000	26.8	5.000	41.6	9.000	55.4
0.600	16.8	2.200	28.0	5.500	43.6	9.500	56.6
0.800	17.3	2.400	29.2	6.000	45.5		
1.000	19.2	2.600	30.4	6.500	47.3		

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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature A 100yr + 40%CC			
Date 07/12/2020 10:57 File BASIN A.SRCX		Designed by DAB Checked by			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	15.963	0.463	18.3	381.4	O K
30 min Summer	16.092	0.592	18.3	507.7	O K
60 min Summer	16.216	0.716	18.3	638.5	O K
120 min Summer	16.261	0.761	18.3	687.5	O K
180 min Summer	16.274	0.774	18.3	702.4	O K
240 min Summer	16.274	0.774	18.3	702.6	O K
360 min Summer	16.258	0.758	18.3	684.7	O K
480 min Summer	16.241	0.741	18.3	666.3	O K
600 min Summer	16.225	0.725	18.3	647.9	O K
720 min Summer	16.208	0.708	18.3	629.7	O K
960 min Summer	16.173	0.673	18.3	592.6	O K
1440 min Summer	16.100	0.600	18.3	516.6	O K
2160 min Summer	16.002	0.502	18.3	419.2	O K
2880 min Summer	15.919	0.419	18.3	340.7	O K
4320 min Summer	15.800	0.300	18.2	234.3	O K
5760 min Summer	15.730	0.230	17.9	175.8	O K
7200 min Summer	15.696	0.196	17.5	148.2	O K
8640 min Summer	15.681	0.181	16.1	136.2	O K
10080 min Summer	15.670	0.170	15.0	127.6	O K
15 min Winter	16.012	0.512	18.3	429.0	O K
30 min Winter	16.154	0.654	18.3	572.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	390.5	26	
30 min Summer	90.183	0.0	525.8	40	
60 min Summer	57.866	0.0	683.0	70	
120 min Summer	32.885	0.0	776.7	126	
180 min Summer	23.621	0.0	837.0	184	
240 min Summer	18.682	0.0	882.8	242	
360 min Summer	13.435	0.0	952.4	322	
480 min Summer	10.653	0.0	1007.0	384	
600 min Summer	8.910	0.0	1052.8	446	
720 min Summer	7.706	0.0	1092.6	514	
960 min Summer	6.140	0.0	1160.6	654	
1440 min Summer	4.483	0.0	1270.5	916	
2160 min Summer	3.294	0.0	1405.8	1300	
2880 min Summer	2.663	0.0	1515.4	1672	
4320 min Summer	2.002	0.0	1706.1	2344	
5760 min Summer	1.655	0.0	1885.5	3016	
7200 min Summer	1.442	0.0	2053.3	3680	
8640 min Summer	1.297	0.0	2216.4	4416	
10080 min Summer	1.193	0.0	2376.1	5144	
15 min Winter	134.447	0.0	438.1	26	
30 min Winter	90.183	0.0	589.4	40	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature A 100yr + 40%CC			
Date 07/12/2020 10:57 File BASIN A.SRCX		Designed by DAB Checked by			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	16.289	0.789	18.3	719.4	O K
120 min Winter	16.340	0.840	18.3	778.0	O K
180 min Winter	16.358	0.858	18.3	798.4	O K
240 min Winter	16.361	0.861	18.3	802.5	O K
360 min Winter	16.349	0.849	18.3	787.6	O K
480 min Winter	16.325	0.825	18.3	760.5	O K
600 min Winter	16.305	0.805	18.3	737.7	O K
720 min Winter	16.284	0.784	18.3	713.6	O K
960 min Winter	16.238	0.738	18.3	662.1	O K
1440 min Winter	16.133	0.633	18.3	550.4	O K
2160 min Winter	15.976	0.476	18.3	393.6	O K
2880 min Winter	15.849	0.349	18.3	277.1	O K
4320 min Winter	15.705	0.205	17.7	155.3	O K
5760 min Winter	15.672	0.172	15.2	128.9	O K
7200 min Winter	15.655	0.155	13.3	115.4	O K
8640 min Winter	15.644	0.144	12.1	107.0	O K
10080 min Winter	15.637	0.137	11.1	101.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	765.3	68	
120 min Winter	32.885	0.0	870.2	124	
180 min Winter	23.621	0.0	937.8	182	
240 min Winter	18.682	0.0	989.1	238	
360 min Winter	13.435	0.0	1067.1	346	
480 min Winter	10.653	0.0	1128.2	410	
600 min Winter	8.910	0.0	1179.5	474	
720 min Winter	7.706	0.0	1224.1	550	
960 min Winter	6.140	0.0	1300.2	706	
1440 min Winter	4.483	0.0	1423.3	1002	
2160 min Winter	3.294	0.0	1574.9	1384	
2880 min Winter	2.663	0.0	1697.7	1732	
4320 min Winter	2.002	0.0	1911.8	2332	
5760 min Winter	1.655	0.0	2111.9	3000	
7200 min Winter	1.442	0.0	2300.0	3688	
8640 min Winter	1.297	0.0	2482.9	4416	
10080 min Winter	1.193	0.0	2662.4	5136	
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Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature A 100yr + 40%CC																																											
Date 07/12/2020 10:57 File BASIN A.SRCX	Designed by DAB Checked by																																											
XP Solutions																																												
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PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature A 100yr + 40%CC	
Date 07/12/2020 10:57 File BASIN A.SRCX	Designed by DAB Checked by	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 16.700

Tank or Pond Structure

Invert Level (m) 15.500

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	706.6	0.401	912.5	0.801	1134.6	1.200	1372.1
0.101	756.5	0.501	966.6	0.901	1192.6		
0.201	807.5	0.601	1021.6	1.001	1251.7		
0.301	859.5	0.701	1077.6	1.101	1311.7		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0192-1830-0900-1830
Design Head (m)	0.900
Design Flow (l/s)	18.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	192
Invert Level (m)	15.500
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	18.3
Flush-Flo™	0.319	18.3
Kick-Flo®	0.658	15.8
Mean Flow over Head Range	-	15.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.7	1.200	21.0	3.000	32.5	7.000	49.0
0.200	17.6	1.400	22.6	3.500	35.0	7.500	50.7
0.300	18.2	1.600	24.1	4.000	37.4	8.000	52.3
0.400	18.1	1.800	25.5	4.500	39.6	8.500	53.9
0.500	17.7	2.000	26.8	5.000	41.6	9.000	55.4
0.600	16.8	2.200	28.0	5.500	43.6	9.500	56.6
0.800	17.3	2.400	29.2	6.000	45.5		
1.000	19.2	2.600	30.4	6.500	47.3		

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K</td></tr><tr><td>600 min Summer</td><td>21.109</td><td>0.209</td><td>25.4</td><td>234.5</td><td>O K</td></tr><tr><td>720 min Summer</td><td>21.104</td><td>0.204</td><td>24.7</td><td>228.8</td><td>O K</td></tr><tr><td>960 min Summer</td><td>21.095</td><td>0.195</td><td>23.2</td><td>217.2</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>21.079</td><td>0.179</td><td>20.6</td><td>197.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>21.060</td><td>0.160</td><td>17.5</td><td>175.6</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>21.047</td><td>0.147</td><td>15.3</td><td>160.2</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>21.030</td><td>0.130</td><td>12.4</td><td>139.9</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>21.018</td><td>0.118</td><td>10.5</td><td>126.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>21.009</td><td>0.109</td><td>9.2</td><td>116.9</td><td>O K</td></tr><tr><td>8640 min 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Date 07/12/2020 12:09 File Basin B.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Winter	21.096	0.196	23.5	219.2	O K
120 min Winter	21.118	0.218	26.6	245.6	O K
180 min Winter	21.127	0.227	27.8	256.3	O K
240 min Winter	21.129	0.229	28.1	259.6	O K
360 min Winter	21.125	0.225	27.6	254.5	O K
480 min Winter	21.118	0.218	26.6	245.2	O K
600 min Winter	21.110	0.210	25.5	235.2	O K
720 min Winter	21.102	0.202	24.3	225.4	O K
960 min Winter	21.088	0.188	22.1	208.2	O K
1440 min Winter	21.066	0.166	18.5	182.6	O K
2160 min Winter	21.045	0.145	14.9	157.5	O K
2880 min Winter	21.031	0.131	12.5	141.3	O K
4320 min Winter	21.013	0.113	9.7	121.0	O K
5760 min Winter	21.002	0.102	8.1	108.4	O K
7200 min Winter	20.994	0.094	7.0	99.4	O K
8640 min Winter	20.988	0.088	6.2	92.6	O K
10080 min Winter	20.983	0.083	5.5	87.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	12.728	0.0	253.7	62
120 min Winter	8.110	0.0	325.0	102
180 min Winter	6.206	0.0	374.0	138
240 min Winter	5.126	0.0	412.5	174
360 min Winter	3.877	0.0	468.6	246
480 min Winter	3.179	0.0	512.8	314
600 min Winter	2.725	0.0	549.8	380
720 min Winter	2.403	0.0	582.0	444
960 min Winter	1.972	0.0	636.5	570
1440 min Winter	1.492	0.0	721.8	818
2160 min Winter	1.128	0.0	826.1	1188
2880 min Winter	0.925	0.0	902.7	1556
4320 min Winter	0.700	0.0	1021.6	2292
5760 min Winter	0.575	0.0	1126.7	3000
7200 min Winter	0.492	0.0	1205.8	3744
8640 min Winter	0.433	0.0	1271.8	4416
10080 min Winter	0.389	0.0	1328.7	5152

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature B 1 yr	
Date 07/12/2020 12:09 File Basin B.srcx	Designed by DAB Checked by MWS	
XP Solutions		Source Control 2019.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 2.437

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:	From:	To:
0	4	4	8	8	12	12	16
	0.609		0.609		0.609		0.610

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature B 1 yr	
Date 07/12/2020 12:09 File Basin B.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 22.100

Tank or Pond Structure

Invert Level (m) 20.900

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1011.9	0.401	1443.0	0.801	1890.0	1.200	2351.9
0.101	1118.2	0.501	1553.3	0.901	2004.3		
0.201	1225.4	0.601	1664.5	1.001	2119.5		
0.301	1333.7	0.701	1776.8	1.101	2235.8		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0238-3000-0900-3000
Design Head (m)	0.900
Design Flow (l/s)	30.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	238
Invert Level (m)	20.900
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	30.0
Flush-Flo™	0.372	29.9
Kick-Flo®	0.690	26.4
Mean Flow over Head Range	-	24.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.8	1.200	34.4	3.000	53.5	7.000	80.8
0.200	24.0	1.400	37.0	3.500	57.7	7.500	83.5
0.300	29.7	1.600	39.5	4.000	61.5	8.000	86.2
0.400	29.9	1.800	41.8	4.500	65.1	8.500	88.8
0.500	29.4	2.000	44.0	5.000	68.6	9.000	91.3
0.600	28.4	2.200	46.1	5.500	71.8	9.500	93.2
0.800	28.3	2.400	48.0	6.000	74.9		
1.000	31.5	2.600	49.9	6.500	77.9		

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature B 100yr + 40%CC			
Date 07/12/2020 11:57 File Basin B.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	21.362	0.462	29.9	581.0	O K
30 min Summer	21.484	0.584	29.9	774.6	O K
60 min Summer	21.602	0.702	29.9	975.7	O K
120 min Summer	21.644	0.744	29.9	1051.0	O K
180 min Summer	21.656	0.756	29.9	1072.8	O K
240 min Summer	21.655	0.755	29.9	1072.0	O K
360 min Summer	21.640	0.740	29.9	1044.0	O K
480 min Summer	21.624	0.724	29.9	1015.4	O K
600 min Summer	21.608	0.708	29.9	986.5	O K
720 min Summer	21.591	0.691	29.9	956.2	O K
960 min Summer	21.554	0.654	29.9	892.2	O K
1440 min Summer	21.485	0.585	29.9	774.8	O K
2160 min Summer	21.390	0.490	29.9	624.5	O K
2880 min Summer	21.312	0.412	29.9	507.0	O K
4320 min Summer	21.203	0.303	29.7	355.6	O K
5760 min Summer	21.144	0.244	29.0	278.4	O K
7200 min Summer	21.119	0.219	26.8	247.4	O K
8640 min Summer	21.104	0.204	24.7	228.9	O K
10080 min Summer	21.094	0.194	23.1	215.5	O K
15 min Winter	21.409	0.509	29.9	654.1	O K
30 min Winter	21.543	0.643	29.9	873.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	598.3	29	
30 min Summer	90.183	0.0	806.3	43	
60 min Summer	57.866	0.0	1049.5	72	
120 min Summer	32.885	0.0	1193.6	128	
180 min Summer	23.621	0.0	1286.4	186	
240 min Summer	18.682	0.0	1356.8	242	
360 min Summer	13.435	0.0	1463.9	316	
480 min Summer	10.653	0.0	1547.8	378	
600 min Summer	8.910	0.0	1618.2	442	
720 min Summer	7.706	0.0	1679.5	510	
960 min Summer	6.140	0.0	1784.0	640	
1440 min Summer	4.483	0.0	1952.8	906	
2160 min Summer	3.294	0.0	2162.1	1284	
2880 min Summer	2.663	0.0	2330.5	1648	
4320 min Summer	2.002	0.0	2623.0	2336	
5760 min Summer	1.655	0.0	2900.3	3000	
7200 min Summer	1.442	0.0	3158.3	3688	
8640 min Summer	1.297	0.0	3409.0	4416	
10080 min Summer	1.193	0.0	3654.0	5144	
15 min Winter	134.447	0.0	671.4	29	
30 min Winter	90.183	0.0	904.1	43	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature B 100yr + 40%CC				
Date 07/12/2020 11:57 File Basin B.srcx		Designed by DAB Checked by MWS				
XP Solutions		Source Control 2019.1				
<u>Summary of Results for 100 year Return Period (+40%)</u>						
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status	
60 min Winter	21.670	0.770	29.9	1100.2	O K	
120 min Winter	21.718	0.818	29.9	1189.6	O K	
180 min Winter	21.734	0.834	29.9	1219.5	O K	
240 min Winter	21.736	0.836	29.9	1224.1	O K	
360 min Winter	21.722	0.822	29.9	1197.4	O K	
480 min Winter	21.700	0.800	29.9	1155.6	O K	
600 min Winter	21.681	0.781	29.9	1118.9	O K	
720 min Winter	21.659	0.759	29.9	1079.1	O K	
960 min Winter	21.612	0.712	29.9	993.2	O K	
1440 min Winter	21.503	0.603	29.9	806.1	O K	
2160 min Winter	21.355	0.455	29.9	570.7	O K	
2880 min Winter	21.239	0.339	29.9	403.6	O K	
4320 min Winter	21.126	0.226	27.7	255.7	O K	
5760 min Winter	21.095	0.195	23.3	217.7	O K	
7200 min Winter	21.078	0.178	20.5	196.7	O K	
8640 min Winter	21.066	0.166	18.5	182.7	O K	
10080 min Winter	21.058	0.158	17.1	172.7	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)		
60 min Winter	57.866	0.0	1176.2	72		
120 min Winter	32.885	0.0	1337.5	126		
180 min Winter	23.621	0.0	1441.5	182		
240 min Winter	18.682	0.0	1520.4	238		
360 min Winter	13.435	0.0	1640.2	346		
480 min Winter	10.653	0.0	1734.3	396		
600 min Winter	8.910	0.0	1813.1	470		
720 min Winter	7.706	0.0	1881.8	548		
960 min Winter	6.140	0.0	1998.7	702		
1440 min Winter	4.483	0.0	2188.0	980		
2160 min Winter	3.294	0.0	2422.1	1356		
2880 min Winter	2.663	0.0	2610.9	1696		
4320 min Winter	2.002	0.0	2939.5	2292		
5760 min Winter	1.655	0.0	3248.7	3000		
7200 min Winter	1.442	0.0	3537.9	3688		
8640 min Winter	1.297	0.0	3819.0	4416		
10080 min Winter	1.193	0.0	4094.6	5144		
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature B 100yr + 40%CC	
Date 07/12/2020 11:57 File Basin B.srcx	Designed by DAB Checked by MWS	
XP Solutions		
Source Control 2019.1		

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 448927 117350	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 2.437

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.609	4 8 0.609	8 12 0.609	12 16 0.610				

PFA Consulting Ltd				Page 4																																																																																																																																
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Model Details Storage is Online Cover Level (m) 22.100 Tank or Pond Structure Invert Level (m) 20.900 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>1011.9</td><td>0.401</td><td>1443.0</td><td>0.801</td><td>1890.0</td><td>1.200</td><td>2351.9</td></tr><tr><td>0.101</td><td>1118.2</td><td>0.501</td><td>1553.3</td><td>0.901</td><td>2004.3</td><td></td><td></td></tr><tr><td>0.201</td><td>1225.4</td><td>0.601</td><td>1664.5</td><td>1.001</td><td>2119.5</td><td></td><td></td></tr><tr><td>0.301</td><td>1333.7</td><td>0.701</td><td>1776.8</td><td>1.101</td><td>2235.8</td><td></td><td></td></tr></tbody></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SHE-0238-3000-0900-3000 Design Head (m)0.900 Design Flow (l/s)30.0 Flush-Flo™Calculated ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)238 Invert Level (m)20.900 Minimum Outlet Pipe Diameter (mm)300 Suggested Manhole Diameter (mm)1500 <table><thead><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>Design Point (Calculated)</td><td>0.900</td><td>30.0</td></tr><tr><td>Flush-Flo™</td><td>0.372</td><td>29.9</td></tr><tr><td>Kick-Flo®</td><td>0.690</td><td>26.4</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>24.4</td></tr></tbody></table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>7.8</td><td>1.200</td><td>34.4</td><td>3.000</td><td>53.5</td><td>7.000</td><td>80.8</td></tr><tr><td>0.200</td><td>24.0</td><td>1.400</td><td>37.0</td><td>3.500</td><td>57.7</td><td>7.500</td><td>83.5</td></tr><tr><td>0.300</td><td>29.7</td><td>1.600</td><td>39.5</td><td>4.000</td><td>61.5</td><td>8.000</td><td>86.2</td></tr><tr><td>0.400</td><td>29.9</td><td>1.800</td><td>41.8</td><td>4.500</td><td>65.1</td><td>8.500</td><td>88.8</td></tr><tr><td>0.500</td><td>29.4</td><td>2.000</td><td>44.0</td><td>5.000</td><td>68.6</td><td>9.000</td><td>91.3</td></tr><tr><td>0.600</td><td>28.4</td><td>2.200</td><td>46.1</td><td>5.500</td><td>71.8</td><td>9.500</td><td>93.2</td></tr><tr><td>0.800</td><td>28.3</td><td>2.400</td><td>48.0</td><td>6.000</td><td>74.9</td><td></td><td></td></tr><tr><td>1.000</td><td>31.5</td><td>2.600</td><td>49.9</td><td>6.500</td><td>77.9</td><td></td><td></td></tr></tbody></table>						Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1011.9	0.401	1443.0	0.801	1890.0	1.200	2351.9	0.101	1118.2	0.501	1553.3	0.901	2004.3			0.201	1225.4	0.601	1664.5	1.001	2119.5			0.301	1333.7	0.701	1776.8	1.101	2235.8			Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	0.900	30.0	Flush-Flo™	0.372	29.9	Kick-Flo®	0.690	26.4	Mean Flow over Head Range	-	24.4	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	7.8	1.200	34.4	3.000	53.5	7.000	80.8	0.200	24.0	1.400	37.0	3.500	57.7	7.500	83.5	0.300	29.7	1.600	39.5	4.000	61.5	8.000	86.2	0.400	29.9	1.800	41.8	4.500	65.1	8.500	88.8	0.500	29.4	2.000	44.0	5.000	68.6	9.000	91.3	0.600	28.4	2.200	46.1	5.500	71.8	9.500	93.2	0.800	28.3	2.400	48.0	6.000	74.9			1.000	31.5	2.600	49.9	6.500	77.9		
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																																																													
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature C 1 year			
Date 07/12/2020 12:29 File Basin C.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	22.204	0.104	31.9	211.5	O K
30 min Summer	22.232	0.132	38.7	269.9	O K
60 min Summer	22.256	0.156	43.9	319.6	O K
120 min Summer	22.270	0.170	46.9	351.3	O K
180 min Summer	22.275	0.175	47.9	362.0	O K
240 min Summer	22.276	0.176	48.0	363.8	O K
360 min Summer	22.271	0.171	47.0	352.3	O K
480 min Summer	22.263	0.163	45.5	336.6	O K
600 min Summer	22.256	0.156	44.0	320.8	O K
720 min Summer	22.249	0.149	42.5	306.3	O K
960 min Summer	22.237	0.137	39.9	280.6	O K
1440 min Summer	22.218	0.118	35.3	240.6	O K
2160 min Summer	22.197	0.097	30.2	196.9	O K
2880 min Summer	22.182	0.082	26.6	165.7	O K
4320 min Summer	22.161	0.061	21.7	123.3	O K
5760 min Summer	22.147	0.047	18.5	95.1	O K
7200 min Summer	22.137	0.037	16.2	73.4	O K
8640 min Summer	22.129	0.029	14.6	57.2	O K
10080 min Summer	22.122	0.022	13.3	44.2	O K
15 min Winter	22.217	0.117	35.1	238.4	O K
30 min Winter	22.249	0.149	42.4	304.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	243.7	27	
30 min Summer	19.618	0.0	324.3	38	
60 min Summer	12.728	0.0	421.1	62	
120 min Summer	8.110	0.0	537.4	94	
180 min Summer	6.206	0.0	617.3	128	
240 min Summer	5.126	0.0	679.4	164	
360 min Summer	3.877	0.0	770.5	230	
480 min Summer	3.179	0.0	842.4	298	
600 min Summer	2.725	0.0	903.0	364	
720 min Summer	2.403	0.0	955.7	428	
960 min Summer	1.972	0.0	1046.2	554	
1440 min Summer	1.492	0.0	1187.7	804	
2160 min Summer	1.128	0.0	1345.8	1172	
2880 min Summer	0.925	0.0	1471.5	1536	
4320 min Summer	0.700	0.0	1671.2	2260	
5760 min Summer	0.575	0.0	1830.2	3000	
7200 min Summer	0.492	0.0	1960.1	3744	
8640 min Summer	0.433	0.0	2069.4	4416	
10080 min Summer	0.389	0.0	2166.9	5152	
15 min Winter	29.494	0.0	272.9	27	
30 min Winter	19.618	0.0	363.7	38	
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PFA Consulting Ltd		Page 2
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature C 1 year	
Date 07/12/2020 12:29 File Basin C.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Winter	22.276	0.176	47.9	363.3	O K
120 min Winter	22.292	0.192	50.0	397.1	O K
180 min Winter	22.295	0.195	50.1	405.0	O K
240 min Winter	22.294	0.194	50.1	401.4	O K
360 min Winter	22.282	0.182	49.2	377.3	O K
480 min Winter	22.270	0.170	46.9	351.3	O K
600 min Winter	22.259	0.159	44.6	326.8	O K
720 min Winter	22.249	0.149	42.4	304.7	O K
960 min Winter	22.231	0.131	38.5	268.0	O K
1440 min Winter	22.206	0.106	32.4	215.4	O K
2160 min Winter	22.181	0.081	26.2	163.3	O K
2880 min Winter	22.164	0.064	22.4	128.8	O K
4320 min Winter	22.142	0.042	17.4	84.7	O K
5760 min Winter	22.128	0.028	14.5	56.9	O K
7200 min Winter	22.119	0.019	12.6	36.9	O K
8640 min Winter	22.111	0.011	11.1	21.6	O K
10080 min Winter	22.105	0.005	10.0	9.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	12.728	0.0	472.1	62
120 min Winter	8.110	0.0	601.3	100
180 min Winter	6.206	0.0	691.4	138
240 min Winter	5.126	0.0	760.9	176
360 min Winter	3.877	0.0	863.2	246
480 min Winter	3.179	0.0	943.9	316
600 min Winter	2.725	0.0	1011.8	382
720 min Winter	2.403	0.0	1070.9	448
960 min Winter	1.972	0.0	1171.0	578
1440 min Winter	1.492	0.0	1330.5	830
2160 min Winter	1.128	0.0	1507.8	1200
2880 min Winter	0.925	0.0	1648.6	1564
4320 min Winter	0.700	0.0	1872.2	2300
5760 min Winter	0.575	0.0	2050.0	3056
7200 min Winter	0.492	0.0	2195.4	3752
8640 min Winter	0.433	0.0	2317.8	4496
10080 min Winter	0.389	0.0	2427.1	5240

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature C 1 year	
Date 07/12/2020 12:29 File Basin C.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 4.425

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	1.109	4 8	1.109	8 12	1.109	12 16	1.098

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To:	(ha)
0 4	0.000

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature C 1 year	
Date 07/12/2020 12:29 File Basin C.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 23.300

Tank or Pond Structure

Invert Level (m) 22.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1981.6	0.401	2369.6	0.801	2773.7	1.200	3192.8
0.101	2077.1	0.501	2469.2	0.901	2877.3		
0.201	2173.6	0.601	2569.7	1.001	2981.8		
0.301	2271.1	0.701	2671.2	1.101	3087.3		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SFF-0300-5450-1000-5210
Design Head (m)	1.000
Design Flow (l/s)	54.5
Flush-Flo™	User Defined
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	300
Invert Level (m)	22.000
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	54.5
Flush-Flo™	0.443	51.9
Kick-Flo®	0.735	47.0
Mean Flow over Head Range	-	42.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.2	1.200	59.5	3.000	92.8	7.000	140.3
0.200	30.9	1.400	64.1	3.500	100.0	7.500	145.2
0.300	50.3	1.600	68.4	4.000	106.8	8.000	149.8
0.400	51.8	1.800	72.4	4.500	113.1	8.500	154.3
0.500	51.8	2.000	76.2	5.000	119.1	9.000	158.7
0.600	50.6	2.200	79.8	5.500	124.7	9.500	163.0
0.800	48.9	2.400	83.3	6.000	130.1		
1.000	54.5	2.600	86.6	6.500	135.3		

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature C 100 year + 40%CC			
Date 07/12/2020 12:27 File Basin C.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	22.574	0.474	51.9	1048.1	O K
30 min Summer	22.714	0.614	51.9	1398.1	O K
60 min Summer	22.848	0.748	51.9	1753.2	O K
120 min Summer	22.892	0.792	51.9	1873.7	O K
180 min Summer	22.901	0.801	51.9	1900.4	O K
240 min Summer	22.897	0.797	51.9	1888.2	O K
360 min Summer	22.874	0.774	51.9	1824.8	O K
480 min Summer	22.852	0.752	51.9	1766.0	O K
600 min Summer	22.832	0.732	51.9	1710.1	O K
720 min Summer	22.812	0.712	51.9	1655.7	O K
960 min Summer	22.772	0.672	51.9	1549.4	O K
1440 min Summer	22.692	0.592	51.9	1342.1	O K
2160 min Summer	22.584	0.484	51.9	1072.6	O K
2880 min Summer	22.497	0.397	51.9	861.8	O K
4320 min Summer	22.376	0.276	51.6	582.9	O K
5760 min Summer	22.306	0.206	50.4	429.0	O K
7200 min Summer	22.274	0.174	47.7	359.3	O K
8640 min Summer	22.256	0.156	44.0	321.6	O K
10080 min Summer	22.243	0.143	41.2	294.0	O K
15 min Winter	22.628	0.528	51.9	1181.4	O K
30 min Winter	22.782	0.682	51.9	1577.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	1114.5	29	
30 min Summer	90.183	0.0	1495.2	43	
60 min Summer	57.866	0.0	1919.5	72	
120 min Summer	32.885	0.0	2181.8	128	
180 min Summer	23.621	0.0	2350.4	184	
240 min Summer	18.682	0.0	2479.6	242	
360 min Summer	13.435	0.0	2673.8	312	
480 min Summer	10.653	0.0	2827.3	374	
600 min Summer	8.910	0.0	2955.6	438	
720 min Summer	7.706	0.0	3068.0	506	
960 min Summer	6.140	0.0	3259.0	646	
1440 min Summer	4.483	0.0	3569.2	914	
2160 min Summer	3.294	0.0	3935.0	1300	
2880 min Summer	2.663	0.0	4241.8	1656	
4320 min Summer	2.002	0.0	4782.5	2344	
5760 min Summer	1.655	0.0	5270.8	3016	
7200 min Summer	1.442	0.0	5741.1	3688	
8640 min Summer	1.297	0.0	6199.7	4416	
10080 min Summer	1.193	0.0	6653.3	5152	
15 min Winter	134.447	0.0	1248.4	29	
30 min Winter	90.183	0.0	1675.2	43	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature C 100 year + 40%CC			
Date 07/12/2020 12:27 File Basin C.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	22.930	0.830	52.6	1979.3	O K
120 min Winter	22.982	0.882	54.0	2128.6	O K
180 min Winter	22.997	0.897	54.4	2171.9	O K
240 min Winter	22.997	0.897	54.4	2170.7	O K
360 min Winter	22.975	0.875	53.8	2107.6	O K
480 min Winter	22.946	0.846	53.1	2027.0	O K
600 min Winter	22.921	0.821	52.4	1956.2	O K
720 min Winter	22.895	0.795	51.9	1882.5	O K
960 min Winter	22.840	0.740	51.9	1732.2	O K
1440 min Winter	22.726	0.626	51.9	1430.5	O K
2160 min Winter	22.555	0.455	51.9	1000.9	O K
2880 min Winter	22.425	0.325	51.9	693.6	O K
4320 min Winter	22.285	0.185	49.7	381.9	O K
5760 min Winter	22.247	0.147	42.0	301.4	O K
7200 min Winter	22.225	0.125	37.0	255.7	O K
8640 min Winter	22.211	0.111	33.5	224.9	O K
10080 min Winter	22.200	0.100	31.0	202.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	2149.6	70	
120 min Winter	32.885	0.0	2443.4	126	
180 min Winter	23.621	0.0	2632.4	182	
240 min Winter	18.682	0.0	2776.9	238	
360 min Winter	13.435	0.0	2994.9	344	
480 min Winter	10.653	0.0	3167.2	392	
600 min Winter	8.910	0.0	3310.7	466	
720 min Winter	7.706	0.0	3436.8	544	
960 min Winter	6.140	0.0	3650.6	698	
1440 min Winter	4.483	0.0	3997.3	996	
2160 min Winter	3.294	0.0	4406.4	1372	
2880 min Winter	2.663	0.0	4751.5	1712	
4320 min Winter	2.002	0.0	5356.3	2300	
5760 min Winter	1.655	0.0	5903.7	3008	
7200 min Winter	1.442	0.0	6430.5	3744	
8640 min Winter	1.297	0.0	6943.7	4424	
10080 min Winter	1.193	0.0	7451.9	5152	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature C 100 year + 40%CC	
Date 07/12/2020 12:27 File Basin C.srcx	Designed by DAB Checked by MWS	
XP Solutions		
Source Control 2019.1		

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 448927 117350	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 4.425

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 1.109	4 8 1.109	8 12 1.109	12 16 1.098				

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	From: To: (ha)
0 4 0.000	

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature C 100 year + 40%CC	
Date 07/12/2020 12:27 File Basin C.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 23.300

Tank or Pond Structure

Invert Level (m) 22.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1981.6	0.401	2369.6	0.801	2773.7	1.200	3192.8
0.101	2077.1	0.501	2469.2	0.901	2877.3		
0.201	2173.6	0.601	2569.7	1.001	2981.8		
0.301	2271.1	0.701	2671.2	1.101	3087.3		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SFF-0300-5450-1000-5210
Design Head (m)	1.000
Design Flow (l/s)	54.5
Flush-Flo™	User Defined
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	300
Invert Level (m)	22.000
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	54.5
Flush-Flo™	0.443	51.9
Kick-Flo®	0.735	47.0
Mean Flow over Head Range	-	42.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.2	1.200	59.5	3.000	92.8	7.000	140.3
0.200	30.9	1.400	64.1	3.500	100.0	7.500	145.2
0.300	50.3	1.600	68.4	4.000	106.8	8.000	149.8
0.400	51.8	1.800	72.4	4.500	113.1	8.500	154.3
0.500	51.8	2.000	76.2	5.000	119.1	9.000	158.7
0.600	50.6	2.200	79.8	5.500	124.7	9.500	163.0
0.800	48.9	2.400	83.3	6.000	130.1		
1.000	54.5	2.600	86.6	6.500	135.3		

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature D 1 year			
Date 07/12/2020 13:29 File Basin D.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	26.001	0.101	7.8	116.0	O K
30 min Summer	26.029	0.129	11.9	149.1	O K
60 min Summer	26.056	0.156	16.0	181.1	O K
120 min Summer	26.076	0.176	19.2	205.1	O K
180 min Summer	26.086	0.186	20.7	217.7	O K
240 min Summer	26.092	0.192	21.6	225.0	O K
360 min Summer	26.095	0.195	22.1	229.1	O K
480 min Summer	26.094	0.194	21.9	228.2	O K
600 min Summer	26.092	0.192	21.6	225.0	O K
720 min Summer	26.089	0.189	21.2	220.8	O K
960 min Summer	26.081	0.181	20.1	211.8	O K
1440 min Summer	26.067	0.167	17.9	195.1	O K
2160 min Summer	26.051	0.151	15.3	175.5	O K
2880 min Summer	26.039	0.139	13.4	161.3	O K
4320 min Summer	26.023	0.123	10.9	141.9	O K
5760 min Summer	26.012	0.112	9.3	129.0	O K
7200 min Summer	26.004	0.104	8.2	119.5	O K
8640 min Summer	25.998	0.098	7.3	112.1	O K
10080 min Summer	25.993	0.093	6.6	106.2	O K
15 min Winter	26.013	0.113	9.4	129.5	O K
30 min Winter	26.044	0.144	14.1	166.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	106.4	28	
30 min Summer	19.618	0.0	145.8	40	
60 min Summer	12.728	0.0	201.6	64	
120 min Summer	8.110	0.0	258.9	100	
180 min Summer	6.206	0.0	298.2	132	
240 min Summer	5.126	0.0	329.2	166	
360 min Summer	3.877	0.0	374.3	232	
480 min Summer	3.179	0.0	409.7	300	
600 min Summer	2.725	0.0	439.4	364	
720 min Summer	2.403	0.0	465.2	428	
960 min Summer	1.972	0.0	508.9	552	
1440 min Summer	1.492	0.0	576.8	800	
2160 min Summer	1.128	0.0	663.2	1168	
2880 min Summer	0.925	0.0	724.6	1532	
4320 min Summer	0.700	0.0	818.7	2256	
5760 min Summer	0.575	0.0	906.1	2992	
7200 min Summer	0.492	0.0	969.4	3688	
8640 min Summer	0.433	0.0	1021.9	4416	
10080 min Summer	0.389	0.0	1066.2	5152	
15 min Winter	29.494	0.0	120.7	28	
30 min Winter	19.618	0.0	165.0	40	
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PFA Consulting Ltd				Page 2	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature D 1 year			
Date 07/12/2020 13:29 File Basin D.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	26.073	0.173	18.8	202.2	O K
120 min Winter	26.094	0.194	21.9	228.2	O K
180 min Winter	26.104	0.204	23.2	239.6	O K
240 min Winter	26.108	0.208	23.7	244.3	O K
360 min Winter	26.106	0.206	23.5	242.3	O K
480 min Winter	26.101	0.201	22.8	235.8	O K
600 min Winter	26.094	0.194	21.9	228.0	O K
720 min Winter	26.088	0.188	21.0	220.2	O K
960 min Winter	26.076	0.176	19.3	205.7	O K
1440 min Winter	26.057	0.157	16.3	182.9	O K
2160 min Winter	26.038	0.138	13.2	159.5	O K
2880 min Winter	26.025	0.125	11.2	143.9	O K
4320 min Winter	26.008	0.108	8.7	124.0	O K
5760 min Winter	25.998	0.098	7.3	111.6	O K
7200 min Winter	25.990	0.090	6.2	102.7	O K
8640 min Winter	25.984	0.084	5.6	95.8	O K
10080 min Winter	25.979	0.079	5.0	90.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	12.728	0.0	226.7	64	
120 min Winter	8.110	0.0	290.9	104	
180 min Winter	6.206	0.0	335.0	140	
240 min Winter	5.126	0.0	369.7	176	
360 min Winter	3.877	0.0	420.2	248	
480 min Winter	3.179	0.0	460.0	318	
600 min Winter	2.725	0.0	493.3	384	
720 min Winter	2.403	0.0	522.2	448	
960 min Winter	1.972	0.0	571.2	576	
1440 min Winter	1.492	0.0	647.6	826	
2160 min Winter	1.128	0.0	743.5	1196	
2880 min Winter	0.925	0.0	812.4	1564	
4320 min Winter	0.700	0.0	918.6	2292	
5760 min Winter	0.575	0.0	1015.2	3000	
7200 min Winter	0.492	0.0	1086.4	3752	
8640 min Winter	0.433	0.0	1145.5	4480	
10080 min Winter	0.389	0.0	1196.0	5240	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature D 1 year	
Date 07/12/2020 13:29 File Basin D.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 2.198

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.548	4 8 0.550	8 12 0.550	12 16 0.550				

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	From: To: (ha)
0 4 0.000	

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature D 1 year	
Date 07/12/2020 13:29 File Basin D.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 27.100

Tank or Pond Structure

Invert Level (m) 25.900

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1115.9	0.401	1359.2	0.801	1618.6	1.200	1893.3
0.101	1175.2	0.501	1422.5	0.901	1685.9		
0.201	1235.5	0.601	1486.9	1.001	1754.3		
0.301	1296.8	0.701	1552.2	1.101	1823.6		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0228-2710-0900-2710
Design Head (m)	0.900
Design Flow (l/s)	27.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	228
Invert Level (m)	25.900
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	27.1
Flush-Flo™	0.358	27.0
Kick-Flo®	0.679	23.7
Mean Flow over Head Range	-	22.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.6	1.200	31.1	3.000	48.3	7.000	72.9
0.200	22.7	1.400	33.5	3.500	52.1	7.500	75.4
0.300	26.8	1.600	35.7	4.000	55.6	8.000	77.8
0.400	26.9	1.800	37.8	4.500	58.8	8.500	80.2
0.500	26.4	2.000	39.8	5.000	61.9	9.000	82.4
0.600	25.4	2.200	41.6	5.500	64.9	9.500	84.2
0.800	25.6	2.400	43.4	6.000	67.7		
1.000	28.5	2.600	45.1	6.500	70.4		

PFA Consulting Ltd					Page 1																																																																																																																																					
Stratton Park House Wanborough Road Swindon SN3 4HG			G277-One Horton Heath Strategic SuDS Feature D 100 year + 40%CC																																																																																																																																							
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature D 100 year + 40%CC			
Date 07/12/2020 13:28 File Basin D.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	26.641	0.741	27.0	994.3	O K
120 min Winter	26.693	0.793	27.0	1076.9	O K
180 min Winter	26.710	0.810	27.0	1105.7	O K
240 min Winter	26.714	0.814	27.0	1111.5	O K
360 min Winter	26.701	0.801	27.0	1090.5	O K
480 min Winter	26.679	0.779	27.0	1054.6	O K
600 min Winter	26.659	0.759	27.0	1023.3	O K
720 min Winter	26.637	0.737	27.0	988.9	O K
960 min Winter	26.589	0.689	27.0	912.9	O K
1440 min Winter	26.478	0.578	27.0	746.7	O K
2160 min Winter	26.332	0.432	27.0	537.8	O K
2880 min Winter	26.221	0.321	26.9	388.9	O K
4320 min Winter	26.117	0.217	24.8	255.9	O K
5760 min Winter	26.088	0.188	21.0	219.7	O K
7200 min Winter	26.071	0.171	18.4	199.2	O K
8640 min Winter	26.060	0.160	16.7	185.6	O K
10080 min Winter	26.052	0.152	15.4	175.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	1058.2	72	
120 min Winter	32.885	0.0	1203.6	126	
180 min Winter	23.621	0.0	1297.2	182	
240 min Winter	18.682	0.0	1368.3	238	
360 min Winter	13.435	0.0	1476.3	346	
480 min Winter	10.653	0.0	1560.9	398	
600 min Winter	8.910	0.0	1631.9	472	
720 min Winter	7.706	0.0	1693.7	548	
960 min Winter	6.140	0.0	1798.9	704	
1440 min Winter	4.483	0.0	1969.1	980	
2160 min Winter	3.294	0.0	2182.9	1356	
2880 min Winter	2.663	0.0	2352.9	1700	
4320 min Winter	2.002	0.0	2647.9	2296	
5760 min Winter	1.655	0.0	2929.1	3000	
7200 min Winter	1.442	0.0	3189.6	3744	
8640 min Winter	1.297	0.0	3442.7	4416	
10080 min Winter	1.193	0.0	3690.1	5144	
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Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature D 100 year + 40%CC	
Date 07/12/2020 13:28 File Basin D.srcx	Designed by DAB Checked by MWS	
XP Solutions		
Source Control 2019.1		

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 448927 117350	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 2.198

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.548	4 8 0.550	8 12 0.550	12 16 0.550				

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	From: To: (ha)
0 4 0.000	

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Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature D 100 year + 40%CC	
Date 07/12/2020 13:28 File Basin D.srcx	Designed by DAB Checked by MWS	
XP Solutions Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 27.100

Tank or Pond Structure

Invert Level (m) 25.900

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1115.9	0.401	1359.2	0.801	1618.6	1.200	1893.3
0.101	1175.2	0.501	1422.5	0.901	1685.9		
0.201	1235.5	0.601	1486.9	1.001	1754.3		
0.301	1296.8	0.701	1552.2	1.101	1823.6		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0228-2710-0900-2710
Design Head (m)	0.900
Design Flow (l/s)	27.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	228
Invert Level (m)	25.900
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	27.1
Flush-Flo™	0.358	27.0
Kick-Flo®	0.679	23.7
Mean Flow over Head Range	-	22.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.6	1.200	31.1	3.000	48.3	7.000	72.9
0.200	22.7	1.400	33.5	3.500	52.1	7.500	75.4
0.300	26.8	1.600	35.7	4.000	55.6	8.000	77.8
0.400	26.9	1.800	37.8	4.500	58.8	8.500	80.2
0.500	26.4	2.000	39.8	5.000	61.9	9.000	82.4
0.600	25.4	2.200	41.6	5.500	64.9	9.500	84.2
0.800	25.6	2.400	43.4	6.000	67.7		
1.000	28.5	2.600	45.1	6.500	70.4		

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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature E 1 year			
Date 07/12/2020 14:02 File Basin E.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	15.289	0.089	6.5	147.6	O K
30 min Summer	15.315	0.115	10.3	191.4	O K
60 min Summer	15.341	0.141	14.7	236.3	O K
120 min Summer	15.362	0.162	18.3	272.4	O K
180 min Summer	15.372	0.172	20.2	290.4	O K
240 min Summer	15.379	0.179	21.4	302.4	O K
360 min Summer	15.385	0.185	22.5	313.1	O K
480 min Summer	15.387	0.187	22.8	316.6	O K
600 min Summer	15.387	0.187	22.8	316.4	O K
720 min Summer	15.386	0.186	22.6	314.1	O K
960 min Summer	15.382	0.182	21.9	306.8	O K
1440 min Summer	15.372	0.172	20.1	289.2	O K
2160 min Summer	15.358	0.158	17.7	265.4	O K
2880 min Summer	15.347	0.147	15.7	246.6	O K
4320 min Summer	15.332	0.132	13.0	219.6	O K
5760 min Summer	15.321	0.121	11.2	201.1	O K
7200 min Summer	15.313	0.113	9.9	186.9	O K
8640 min Summer	15.306	0.106	8.9	175.4	O K
10080 min Summer	15.301	0.101	8.1	166.5	O K
15 min Winter	15.300	0.100	8.0	164.9	O K
30 min Winter	15.328	0.128	12.5	213.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	123.9	29	
30 min Summer	19.618	0.0	172.4	42	
60 min Summer	12.728	0.0	246.7	68	
120 min Summer	8.110	0.0	318.3	112	
180 min Summer	6.206	0.0	367.4	140	
240 min Summer	5.126	0.0	406.1	172	
360 min Summer	3.877	0.0	462.4	240	
480 min Summer	3.179	0.0	506.5	308	
600 min Summer	2.725	0.0	543.5	374	
720 min Summer	2.403	0.0	575.6	440	
960 min Summer	1.972	0.0	629.7	568	
1440 min Summer	1.492	0.0	713.4	818	
2160 min Summer	1.128	0.0	827.0	1188	
2880 min Summer	0.925	0.0	903.2	1556	
4320 min Summer	0.700	0.0	1018.6	2292	
5760 min Summer	0.575	0.0	1133.0	3008	
7200 min Summer	0.492	0.0	1211.8	3744	
8640 min Summer	0.433	0.0	1276.5	4488	
10080 min Summer	0.389	0.0	1330.1	5152	
15 min Winter	29.494	0.0	141.5	29	
30 min Winter	19.618	0.0	196.1	41	
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PFA Consulting Ltd				Page 2	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature E 1 year			
Date 07/12/2020 14:02 File Basin E.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	15.357	0.157	17.5	263.9	O K
120 min Winter	15.380	0.180	21.6	304.1	O K
180 min Winter	15.390	0.190	23.4	322.0	O K
240 min Winter	15.396	0.196	24.3	332.4	O K
360 min Winter	15.399	0.199	24.8	337.0	O K
480 min Winter	15.397	0.197	24.6	334.3	O K
600 min Winter	15.394	0.194	24.0	328.4	O K
720 min Winter	15.390	0.190	23.3	321.2	O K
960 min Winter	15.381	0.181	21.8	306.1	O K
1440 min Winter	15.366	0.166	19.0	278.7	O K
2160 min Winter	15.348	0.148	15.8	247.4	O K
2880 min Winter	15.335	0.135	13.6	225.1	O K
4320 min Winter	15.318	0.118	10.7	195.5	O K
5760 min Winter	15.306	0.106	8.9	176.5	O K
7200 min Winter	15.298	0.098	7.8	162.5	O K
8640 min Winter	15.292	0.092	6.8	151.9	O K
10080 min Winter	15.287	0.087	6.2	143.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	12.728	0.0	278.1	66	
120 min Winter	8.110	0.0	358.4	116	
180 min Winter	6.206	0.0	413.4	146	
240 min Winter	5.126	0.0	456.8	184	
360 min Winter	3.877	0.0	519.9	256	
480 min Winter	3.179	0.0	569.4	328	
600 min Winter	2.725	0.0	610.9	396	
720 min Winter	2.403	0.0	646.9	464	
960 min Winter	1.972	0.0	707.7	596	
1440 min Winter	1.492	0.0	801.9	850	
2160 min Winter	1.128	0.0	927.6	1220	
2880 min Winter	0.925	0.0	1013.2	1592	
4320 min Winter	0.700	0.0	1143.7	2332	
5760 min Winter	0.575	0.0	1269.9	3064	
7200 min Winter	0.492	0.0	1358.4	3760	
8640 min Winter	0.433	0.0	1431.5	4504	
10080 min Winter	0.389	0.0	1492.8	5248	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature E 1 year	
Date 07/12/2020 14:02 File Basin E.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 2.755

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.688	4 8 0.688	8 12 0.688	12 16 0.691				

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature E 1 year	
Date 07/12/2020 14:02 File Basin E.srcx	Designed by DAB Checked by MWS	
XP Solutions Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 16.400

Tank or Pond Structure

Invert Level (m) 15.200

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1613.4	0.401	1959.3	0.801	2321.2	1.200	2698.2
0.101	1698.4	0.501	2048.2	0.901	2414.2		
0.201	1784.3	0.601	2138.2	1.001	2508.2		
0.301	1871.3	0.701	2229.2	1.101	2603.2		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0245-3230-0900-3230
Design Head (m)	0.900
Design Flow (l/s)	32.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	245
Invert Level (m)	15.200
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	32.3
Flush-Flo™	0.380	32.3
Kick-Flo®	0.696	28.6
Mean Flow over Head Range	-	26.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.0	1.200	37.1	3.000	57.7	7.000	87.1
0.200	25.0	1.400	39.9	3.500	62.2	7.500	90.1
0.300	31.9	1.600	42.6	4.000	66.3	8.000	93.0
0.400	32.3	1.800	45.1	4.500	70.2	8.500	95.7
0.500	31.8	2.000	47.4	5.000	73.9	9.000	98.5
0.600	30.7	2.200	49.6	5.500	77.4	9.500	100.5
0.800	30.5	2.400	51.8	6.000	80.8		
1.000	34.0	2.600	53.8	6.500	84.0		

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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature E 100yr + 40%CC			
Date 07/12/2020 14:01 File Basin E.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	15.573	0.373	32.3	661.8	O K
30 min Summer	15.684	0.484	32.3	880.7	O K
60 min Summer	15.794	0.594	32.3	1109.5	O K
120 min Summer	15.837	0.637	32.3	1202.6	O K
180 min Summer	15.852	0.652	32.3	1235.9	O K
240 min Summer	15.855	0.655	32.3	1243.0	O K
360 min Summer	15.846	0.646	32.3	1222.0	O K
480 min Summer	15.835	0.635	32.3	1197.9	O K
600 min Summer	15.823	0.623	32.3	1172.5	O K
720 min Summer	15.811	0.611	32.3	1145.8	O K
960 min Summer	15.784	0.584	32.3	1088.7	O K
1440 min Summer	15.730	0.530	32.3	975.2	O K
2160 min Summer	15.654	0.454	32.3	820.3	O K
2880 min Summer	15.590	0.390	32.3	695.0	O K
4320 min Summer	15.502	0.302	32.0	526.0	O K
5760 min Summer	15.451	0.251	31.3	431.4	O K
7200 min Summer	15.428	0.228	29.2	389.0	O K
8640 min Summer	15.413	0.213	27.0	362.0	O K
10080 min Summer	15.402	0.202	25.4	343.3	O K
15 min Winter	15.615	0.415	32.3	744.0	O K
30 min Winter	15.738	0.538	32.3	991.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	656.9	29	
30 min Summer	90.183	0.0	890.0	43	
60 min Summer	57.866	0.0	1176.0	72	
120 min Summer	32.885	0.0	1338.3	128	
180 min Summer	23.621	0.0	1442.9	186	
240 min Summer	18.682	0.0	1522.2	242	
360 min Summer	13.435	0.0	1642.6	322	
480 min Summer	10.653	0.0	1736.9	380	
600 min Summer	8.910	0.0	1816.0	440	
720 min Summer	7.706	0.0	1884.7	506	
960 min Summer	6.140	0.0	2001.6	640	
1440 min Summer	4.483	0.0	2189.7	908	
2160 min Summer	3.294	0.0	2437.4	1296	
2880 min Summer	2.663	0.0	2626.5	1656	
4320 min Summer	2.002	0.0	2951.8	2348	
5760 min Summer	1.655	0.0	3274.6	3016	
7200 min Summer	1.442	0.0	3565.1	3744	
8640 min Summer	1.297	0.0	3846.4	4424	
10080 min Summer	1.193	0.0	4118.7	5152	
15 min Winter	134.447	0.0	739.0	29	
30 min Winter	90.183	0.0	999.6	43	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature E 100yr + 40%CC			
Date 07/12/2020 14:01 File Basin E.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	15.860	0.660	32.3	1252.2	O K
120 min Winter	15.910	0.710	32.3	1364.5	O K
180 min Winter	15.930	0.730	32.3	1409.1	O K
240 min Winter	15.937	0.737	32.3	1424.1	O K
360 min Winter	15.931	0.731	32.3	1411.5	O K
480 min Winter	15.914	0.714	32.3	1373.5	O K
600 min Winter	15.897	0.697	32.3	1334.8	O K
720 min Winter	15.879	0.679	32.3	1294.1	O K
960 min Winter	15.838	0.638	32.3	1204.8	O K
1440 min Winter	15.753	0.553	32.3	1023.0	O K
2160 min Winter	15.634	0.434	32.3	779.9	O K
2880 min Winter	15.539	0.339	32.2	596.6	O K
4320 min Winter	15.437	0.237	30.5	406.7	O K
5760 min Winter	15.406	0.206	25.9	350.2	O K
7200 min Winter	15.388	0.188	22.9	317.9	O K
8640 min Winter	15.376	0.176	20.8	296.2	O K
10080 min Winter	15.367	0.167	19.2	280.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	1318.8	72	
120 min Winter	32.885	0.0	1500.6	128	
180 min Winter	23.621	0.0	1617.6	184	
240 min Winter	18.682	0.0	1706.4	240	
360 min Winter	13.435	0.0	1841.2	350	
480 min Winter	10.653	0.0	1946.8	448	
600 min Winter	8.910	0.0	2035.3	482	
720 min Winter	7.706	0.0	2112.4	556	
960 min Winter	6.140	0.0	2243.4	702	
1440 min Winter	4.483	0.0	2454.4	984	
2160 min Winter	3.294	0.0	2731.4	1372	
2880 min Winter	2.663	0.0	2943.6	1716	
4320 min Winter	2.002	0.0	3309.7	2336	
5760 min Winter	1.655	0.0	3668.5	3056	
7200 min Winter	1.442	0.0	3994.3	3752	
8640 min Winter	1.297	0.0	4310.2	4488	
10080 min Winter	1.193	0.0	4617.4	5152	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature E 100yr + 40%CC	
Date 07/12/2020 14:01 File Basin E.srcx	Designed by DAB Checked by MWS	
XP Solutions		
Source Control 2019.1		

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 448927 117350	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 2.755

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.688	4 8 0.688	8 12 0.688	12 16 0.691				

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature E 100yr + 40%CC	
Date 07/12/2020 14:01 File Basin E.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 16.400

Tank or Pond Structure

Invert Level (m) 15.200

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1613.4	0.401	1959.3	0.801	2321.2	1.200	2698.2
0.101	1698.4	0.501	2048.2	0.901	2414.2		
0.201	1784.3	0.601	2138.2	1.001	2508.2		
0.301	1871.3	0.701	2229.2	1.101	2603.2		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0245-3230-0900-3230
Design Head (m)	0.900
Design Flow (l/s)	32.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	245
Invert Level (m)	15.200
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	32.3
Flush-Flo™	0.380	32.3
Kick-Flo®	0.696	28.6
Mean Flow over Head Range	-	26.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.0	1.200	37.1	3.000	57.7	7.000	87.1
0.200	25.0	1.400	39.9	3.500	62.2	7.500	90.1
0.300	31.9	1.600	42.6	4.000	66.3	8.000	93.0
0.400	32.3	1.800	45.1	4.500	70.2	8.500	95.7
0.500	31.8	2.000	47.4	5.000	73.9	9.000	98.5
0.600	30.7	2.200	49.6	5.500	77.4	9.500	100.5
0.800	30.5	2.400	51.8	6.000	80.8		
1.000	34.0	2.600	53.8	6.500	84.0		

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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature EM 1 year			
Date 07/12/2020 15:39 File Basin Employment.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	19.822	0.122	15.1	77.0	O K
30 min Summer	19.855	0.155	15.3	99.3	O K
60 min Summer	19.883	0.183	15.4	118.3	O K
120 min Summer	19.897	0.197	15.5	128.1	O K
180 min Summer	19.899	0.199	15.5	129.7	O K
240 min Summer	19.897	0.197	15.5	128.2	O K
360 min Summer	19.886	0.186	15.4	120.6	O K
480 min Summer	19.874	0.174	15.4	112.3	O K
600 min Summer	19.862	0.162	15.4	104.0	O K
720 min Summer	19.850	0.150	15.3	95.8	O K
960 min Summer	19.828	0.128	15.2	80.8	O K
1440 min Summer	19.793	0.093	14.8	58.1	O K
2160 min Summer	19.765	0.065	12.9	40.1	O K
2880 min Summer	19.747	0.047	11.3	29.0	O K
4320 min Summer	19.726	0.026	9.1	15.9	O K
5760 min Summer	19.714	0.014	7.7	8.2	O K
7200 min Summer	19.705	0.005	6.8	3.0	O K
8640 min Summer	19.700	0.000	6.1	0.0	O K
10080 min Summer	19.700	0.000	5.5	0.0	O K
15 min Winter	19.838	0.138	15.2	87.9	O K
30 min Winter	19.876	0.176	15.4	113.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	95.1	26	
30 min Summer	19.618	0.0	126.8	38	
60 min Summer	12.728	0.0	164.4	62	
120 min Summer	8.110	0.0	209.3	100	
180 min Summer	6.206	0.0	240.7	134	
240 min Summer	5.126	0.0	264.9	168	
360 min Summer	3.877	0.0	300.2	236	
480 min Summer	3.179	0.0	328.4	304	
600 min Summer	2.725	0.0	352.0	370	
720 min Summer	2.403	0.0	373.0	434	
960 min Summer	1.972	0.0	407.8	558	
1440 min Summer	1.492	0.0	463.1	792	
2160 min Summer	1.128	0.0	525.1	1148	
2880 min Summer	0.925	0.0	573.9	1508	
4320 min Summer	0.700	0.0	651.7	2216	
5760 min Summer	0.575	0.0	713.9	2944	
7200 min Summer	0.492	0.0	764.2	3680	
8640 min Summer	0.433	0.0	807.1	0	
10080 min Summer	0.389	0.0	845.1	0	
15 min Winter	29.494	0.0	106.5	27	
30 min Winter	19.618	0.0	142.0	39	
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Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature EM 1 year	
Date 07/12/2020 15:39 File Basin Employment.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Winter	19.910	0.210	15.5	137.0	O K
120 min Winter	19.926	0.226	15.5	149.0	O K
180 min Winter	19.928	0.228	15.5	150.0	O K
240 min Winter	19.923	0.223	15.5	146.7	O K
360 min Winter	19.904	0.204	15.5	133.0	O K
480 min Winter	19.883	0.183	15.4	118.2	O K
600 min Winter	19.862	0.162	15.4	104.2	O K
720 min Winter	19.843	0.143	15.3	91.0	O K
960 min Winter	19.809	0.109	15.0	68.7	O K
1440 min Winter	19.771	0.071	13.4	43.8	O K
2160 min Winter	19.742	0.042	10.8	25.7	O K
2880 min Winter	19.726	0.026	9.1	15.8	O K
4320 min Winter	19.707	0.007	7.0	4.2	O K
5760 min Winter	19.700	0.000	5.9	0.0	O K
7200 min Winter	19.700	0.000	5.0	0.0	O K
8640 min Winter	19.700	0.000	4.4	0.0	O K
10080 min Winter	19.700	0.000	4.0	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	12.728	0.0	184.1	64
120 min Winter	8.110	0.0	234.9	108
180 min Winter	6.206	0.0	269.3	144
240 min Winter	5.126	0.0	296.7	182
360 min Winter	3.877	0.0	336.6	256
480 min Winter	3.179	0.0	368.2	328
600 min Winter	2.725	0.0	394.8	394
720 min Winter	2.403	0.0	417.4	458
960 min Winter	1.972	0.0	456.9	578
1440 min Winter	1.492	0.0	518.7	808
2160 min Winter	1.128	0.0	588.0	1164
2880 min Winter	0.925	0.0	642.7	1532
4320 min Winter	0.700	0.0	729.9	2252
5760 min Winter	0.575	0.0	799.6	0
7200 min Winter	0.492	0.0	856.2	0
8640 min Winter	0.433	0.0	904.0	0
10080 min Winter	0.389	0.0	946.6	0

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature EM 1 year	
Date 07/12/2020 15:39 File Basin Employment.srcx	Designed by DAB Checked by MWS	
XP Solutions		Source Control 2019.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.725

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.424	4 8	0.424	8 12	0.424	12 16	0.453

PFA Consulting Ltd		Page 4																																																																																																																															
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature EM 1 year																																																																																																																																
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Model Details Storage is Online Cover Level (m) 21.074 Tank or Pond Structure Invert Level (m) 19.700 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>601.7</td><td>0.401</td><td>806.9</td><td>0.801</td><td>1027.7</td><td>1.201</td><td>1264.4</td></tr><tr><td>0.101</td><td>651.5</td><td>0.501</td><td>860.6</td><td>0.901</td><td>1085.4</td><td>1.301</td><td>1326.0</td></tr><tr><td>0.201</td><td>702.3</td><td>0.601</td><td>915.3</td><td>1.001</td><td>1144.1</td><td>1.374</td><td>1371.5</td></tr><tr><td>0.301</td><td>754.1</td><td>0.701</td><td>971.0</td><td>1.101</td><td>1203.7</td><td></td><td></td></tr></tbody></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SFF-0177-1620-1100-1550 Design Head (m)1.100 Design Flow (l/s)16.2 Flush-Flo™User Defined ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)177 Invert Level (m)19.600 Minimum Outlet Pipe Diameter (mm)225 Suggested Manhole Diameter (mm)1500 <table><thead><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>Design Point (Calculated)</td><td>1.100</td><td>16.2</td></tr><tr><td>Flush-Flo™</td><td>0.323</td><td>15.5</td></tr><tr><td>Kick-Flo®</td><td>0.705</td><td>13.1</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>13.4</td></tr></tbody></table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>6.3</td><td>1.200</td><td>16.9</td><td>3.000</td><td>26.1</td><td>7.000</td><td>39.3</td></tr><tr><td>0.200</td><td>14.9</td><td>1.400</td><td>18.2</td><td>3.500</td><td>28.2</td><td>7.500</td><td>40.7</td></tr><tr><td>0.300</td><td>15.5</td><td>1.600</td><td>19.4</td><td>4.000</td><td>30.0</td><td>8.000</td><td>42.0</td></tr><tr><td>0.400</td><td>15.4</td><td>1.800</td><td>20.5</td><td>4.500</td><td>31.8</td><td>8.500</td><td>43.2</td></tr><tr><td>0.500</td><td>15.1</td><td>2.000</td><td>21.5</td><td>5.000</td><td>33.4</td><td>9.000</td><td>44.4</td></tr><tr><td>0.600</td><td>14.5</td><td>2.200</td><td>22.5</td><td>5.500</td><td>35.0</td><td>9.500</td><td>45.6</td></tr><tr><td>0.800</td><td>13.9</td><td>2.400</td><td>23.5</td><td>6.000</td><td>36.5</td><td></td><td></td></tr><tr><td>1.000</td><td>15.5</td><td>2.600</td><td>24.4</td><td>6.500</td><td>37.9</td><td></td><td></td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	601.7	0.401	806.9	0.801	1027.7	1.201	1264.4	0.101	651.5	0.501	860.6	0.901	1085.4	1.301	1326.0	0.201	702.3	0.601	915.3	1.001	1144.1	1.374	1371.5	0.301	754.1	0.701	971.0	1.101	1203.7			Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.100	16.2	Flush-Flo™	0.323	15.5	Kick-Flo®	0.705	13.1	Mean Flow over Head Range	-	13.4	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	6.3	1.200	16.9	3.000	26.1	7.000	39.3	0.200	14.9	1.400	18.2	3.500	28.2	7.500	40.7	0.300	15.5	1.600	19.4	4.000	30.0	8.000	42.0	0.400	15.4	1.800	20.5	4.500	31.8	8.500	43.2	0.500	15.1	2.000	21.5	5.000	33.4	9.000	44.4	0.600	14.5	2.200	22.5	5.500	35.0	9.500	45.6	0.800	13.9	2.400	23.5	6.000	36.5			1.000	15.5	2.600	24.4	6.500	37.9		
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature EM 100 year + 40%CC			
Date 07/12/2020 15:35 File Basin Employment.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	20.254	0.554	15.5	411.6	O K
30 min Summer	20.403	0.703	15.5	549.7	O K
60 min Summer	20.541	0.841	15.5	690.2	O K
120 min Summer	20.591	0.891	15.5	743.4	O K
180 min Summer	20.607	0.907	15.5	760.0	O K
240 min Summer	20.608	0.908	15.5	761.5	O K
360 min Summer	20.591	0.891	15.5	743.0	O K
480 min Summer	20.567	0.867	15.5	717.3	O K
600 min Summer	20.546	0.846	15.5	695.1	O K
720 min Summer	20.527	0.827	15.5	675.2	O K
960 min Summer	20.493	0.793	15.5	640.4	O K
1440 min Summer	20.435	0.735	15.5	581.1	O K
2160 min Summer	20.352	0.652	15.5	501.1	O K
2880 min Summer	20.262	0.562	15.5	418.5	O K
4320 min Summer	20.108	0.408	15.5	287.3	O K
5760 min Summer	19.993	0.293	15.5	197.7	O K
7200 min Summer	19.911	0.211	15.5	138.1	O K
8640 min Summer	19.856	0.156	15.3	99.9	O K
10080 min Summer	19.820	0.120	15.1	75.9	O K
15 min Winter	20.312	0.612	15.5	464.2	O K
30 min Winter	20.473	0.773	15.5	619.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	434.5	30	
30 min Summer	90.183	0.0	583.0	44	
60 min Summer	57.866	0.0	748.0	72	
120 min Summer	32.885	0.0	850.9	130	
180 min Summer	23.621	0.0	916.5	188	
240 min Summer	18.682	0.0	966.4	244	
360 min Summer	13.435	0.0	1042.5	360	
480 min Summer	10.653	0.0	1102.0	420	
600 min Summer	8.910	0.0	1152.5	482	
720 min Summer	7.706	0.0	1196.2	544	
960 min Summer	6.140	0.0	1270.7	678	
1440 min Summer	4.483	0.0	1391.5	956	
2160 min Summer	3.294	0.0	1533.5	1372	
2880 min Summer	2.663	0.0	1653.4	1764	
4320 min Summer	2.002	0.0	1864.3	2480	
5760 min Summer	1.655	0.0	2054.8	3176	
7200 min Summer	1.442	0.0	2238.0	3888	
8640 min Summer	1.297	0.0	2416.8	4512	
10080 min Summer	1.193	0.0	2593.8	5248	
15 min Winter	134.447	0.0	486.5	30	
30 min Winter	90.183	0.0	653.2	44	
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Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature EM 100 year + 40%CC	
Date 07/12/2020 15:35 File Basin Employment.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Winter	20.625	0.925	15.7	780.2	O K
120 min Winter	20.684	0.984	16.1	845.9	O K
180 min Winter	20.706	1.006	16.2	870.7	O K
240 min Winter	20.712	1.012	16.3	877.9	O K
360 min Winter	20.703	1.003	16.2	867.3	O K
480 min Winter	20.681	0.981	16.1	842.2	O K
600 min Winter	20.654	0.954	15.9	811.9	O K
720 min Winter	20.632	0.932	15.7	787.6	O K
960 min Winter	20.589	0.889	15.5	740.9	O K
1440 min Winter	20.506	0.806	15.5	653.3	O K
2160 min Winter	20.381	0.681	15.5	529.1	O K
2880 min Winter	20.235	0.535	15.5	394.7	O K
4320 min Winter	19.991	0.291	15.5	196.5	O K
5760 min Winter	19.843	0.143	15.3	91.0	O K
7200 min Winter	19.784	0.084	14.5	52.0	O K
8640 min Winter	19.767	0.067	13.1	41.2	O K
10080 min Winter	19.755	0.055	12.1	34.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	57.866	0.0	838.5	72
120 min Winter	32.885	0.0	952.8	128
180 min Winter	23.621	0.0	1026.1	184
240 min Winter	18.682	0.0	1082.5	240
360 min Winter	13.435	0.0	1167.5	352
480 min Winter	10.653	0.0	1234.8	460
600 min Winter	8.910	0.0	1290.7	546
720 min Winter	7.706	0.0	1339.5	574
960 min Winter	6.140	0.0	1422.9	730
1440 min Winter	4.483	0.0	1558.6	1036
2160 min Winter	3.294	0.0	1717.3	1484
2880 min Winter	2.663	0.0	1852.0	1884
4320 min Winter	2.002	0.0	2088.3	2560
5760 min Winter	1.655	0.0	2301.5	3176
7200 min Winter	1.442	0.0	2506.8	3712
8640 min Winter	1.297	0.0	2706.9	4416
10080 min Winter	1.193	0.0	2905.1	5144

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature EM 100 year + 40%CC	
Date 07/12/2020 15:35 File Basin Employment.srcx	Designed by DAB Checked by MWS	
XP Solutions		Source Control 2019.1

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 448927 117350	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.725

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.424	4 8 0.424	8 12 0.424	12 16 0.453				

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Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature EM 100 year + 40%CC	
Date 07/12/2020 15:35 File Basin Employment.srcx	Designed by DAB Checked by MWS	
XP Solutions Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 21.074

Tank or Pond Structure

Invert Level (m) 19.700

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	601.7	0.401	806.9	0.801	1027.7	1.201	1264.4
0.101	651.5	0.501	860.6	0.901	1085.4	1.301	1326.0
0.201	702.3	0.601	915.3	1.001	1144.1	1.374	1371.5
0.301	754.1	0.701	971.0	1.101	1203.7		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SFF-0177-1620-1100-1550
Design Head (m)	1.100
Design Flow (l/s)	16.2
Flush-Flo™	User Defined
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	177
Invert Level (m)	19.600
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	16.2
Flush-Flo™	0.323	15.5
Kick-Flo®	0.705	13.1
Mean Flow over Head Range	-	13.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.3	1.200	16.9	3.000	26.1	7.000	39.3
0.200	14.9	1.400	18.2	3.500	28.2	7.500	40.7
0.300	15.5	1.600	19.4	4.000	30.0	8.000	42.0
0.400	15.4	1.800	20.5	4.500	31.8	8.500	43.2
0.500	15.1	2.000	21.5	5.000	33.4	9.000	44.4
0.600	14.5	2.200	22.5	5.500	35.0	9.500	45.6
0.800	13.9	2.400	23.5	6.000	36.5		
1.000	15.5	2.600	24.4	6.500	37.9		

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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature F 1 year			
Date 07/12/2020 14:08 File Basin F.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.353	0.103	8.0	115.0	O K
30 min Summer	18.382	0.132	12.2	147.7	O K
60 min Summer	18.408	0.158	16.4	179.1	O K
120 min Summer	18.428	0.178	19.6	202.7	O K
180 min Summer	18.438	0.188	21.0	215.0	O K
240 min Summer	18.444	0.194	21.9	221.9	O K
360 min Summer	18.447	0.197	22.3	225.6	O K
480 min Summer	18.446	0.196	22.1	224.3	O K
600 min Summer	18.443	0.193	21.7	220.9	O K
720 min Summer	18.440	0.190	21.2	216.5	O K
960 min Summer	18.432	0.182	20.1	207.2	O K
1440 min Summer	18.418	0.168	17.9	190.4	O K
2160 min Summer	18.401	0.151	15.3	170.8	O K
2880 min Summer	18.389	0.139	13.4	156.8	O K
4320 min Summer	18.373	0.123	10.9	137.8	O K
5760 min Summer	18.362	0.112	9.3	125.0	O K
7200 min Summer	18.354	0.104	8.2	115.8	O K
8640 min Summer	18.348	0.098	7.3	108.7	O K
10080 min Summer	18.343	0.093	6.6	102.8	O K
15 min Winter	18.365	0.115	9.7	128.4	O K
30 min Winter	18.396	0.146	14.5	164.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	106.5	28	
30 min Summer	19.618	0.0	145.7	40	
60 min Summer	12.728	0.0	200.7	64	
120 min Summer	8.110	0.0	257.7	100	
180 min Summer	6.206	0.0	296.8	132	
240 min Summer	5.126	0.0	327.6	166	
360 min Summer	3.877	0.0	372.4	232	
480 min Summer	3.179	0.0	407.7	298	
600 min Summer	2.725	0.0	437.2	364	
720 min Summer	2.403	0.0	462.9	426	
960 min Summer	1.972	0.0	506.3	552	
1440 min Summer	1.492	0.0	573.9	798	
2160 min Summer	1.128	0.0	659.3	1168	
2880 min Summer	0.925	0.0	720.3	1532	
4320 min Summer	0.700	0.0	814.2	2256	
5760 min Summer	0.575	0.0	900.5	2992	
7200 min Summer	0.492	0.0	963.5	3688	
8640 min Summer	0.433	0.0	1015.8	4416	
10080 min Summer	0.389	0.0	1060.0	5152	
15 min Winter	29.494	0.0	120.7	28	
30 min Winter	19.618	0.0	164.8	40	
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PFA Consulting Ltd		Page 2
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature F 1 year	
Date 07/12/2020 14:08 File Basin F.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Winter	18.426	0.176	19.2	200.0	O K
120 min Winter	18.447	0.197	22.2	225.4	O K
180 min Winter	18.456	0.206	23.4	236.4	O K
240 min Winter	18.460	0.210	23.9	240.7	O K
360 min Winter	18.457	0.207	23.6	238.2	O K
480 min Winter	18.452	0.202	22.9	231.4	O K
600 min Winter	18.445	0.195	22.0	223.4	O K
720 min Winter	18.439	0.189	21.1	215.4	O K
960 min Winter	18.427	0.177	19.3	200.7	O K
1440 min Winter	18.407	0.157	16.2	178.0	O K
2160 min Winter	18.388	0.138	13.2	154.9	O K
2880 min Winter	18.375	0.125	11.2	139.5	O K
4320 min Winter	18.358	0.108	8.7	120.2	O K
5760 min Winter	18.347	0.097	7.2	108.0	O K
7200 min Winter	18.340	0.090	6.2	99.2	O K
8640 min Winter	18.334	0.084	5.5	92.6	O K
10080 min Winter	18.329	0.079	5.0	87.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	12.728	0.0	225.7	64
120 min Winter	8.110	0.0	289.6	102
180 min Winter	6.206	0.0	333.4	140
240 min Winter	5.126	0.0	367.9	176
360 min Winter	3.877	0.0	418.1	248
480 min Winter	3.179	0.0	457.6	316
600 min Winter	2.725	0.0	490.7	382
720 min Winter	2.403	0.0	519.5	448
960 min Winter	1.972	0.0	568.2	574
1440 min Winter	1.492	0.0	644.2	824
2160 min Winter	1.128	0.0	739.1	1192
2880 min Winter	0.925	0.0	807.6	1560
4320 min Winter	0.700	0.0	913.3	2296
5760 min Winter	0.575	0.0	1009.0	3008
7200 min Winter	0.492	0.0	1079.7	3744
8640 min Winter	0.433	0.0	1138.6	4496
10080 min Winter	0.389	0.0	1188.9	5152

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature F 1 year	
Date 07/12/2020 14:08 File Basin F.srcx	Designed by DAB Checked by MWS	
XP Solutions		Source Control 2019.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 2.184

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.546	4 8	0.546	8 12	0.546	12 16	0.546

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature F 1 year	
Date 07/12/2020 14:08 File Basin F.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 19.450

Tank or Pond Structure

Invert Level (m) 18.250

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1076.4	0.401	1361.2	0.801	1662.1	1.200	1978.3
0.101	1146.1	0.501	1434.9	0.901	1739.9		
0.201	1216.8	0.601	1509.7	1.001	1818.6		
0.301	1288.5	0.701	1585.4	1.101	1898.4		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0227-2690-0900-2690
Design Head (m)	0.900
Design Flow (l/s)	26.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	227
Invert Level (m)	18.250
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	26.9
Flush-Flo™	0.357	26.9
Kick-Flo®	0.682	23.6
Mean Flow over Head Range	-	22.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.6	1.200	30.9	3.000	48.0	7.000	72.4
0.200	22.6	1.400	33.2	3.500	51.7	7.500	74.9
0.300	26.7	1.600	35.4	4.000	55.2	8.000	77.3
0.400	26.8	1.800	37.5	4.500	58.4	8.500	79.6
0.500	26.3	2.000	39.5	5.000	61.5	9.000	81.8
0.600	25.3	2.200	41.3	5.500	64.4	9.500	83.6
0.800	25.4	2.400	43.1	6.000	67.2		
1.000	28.3	2.600	44.8	6.500	69.8		

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature F 100yr + 40%CC			
Date 07/12/2020 14:10 File Basin F.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.675	0.425	26.9	521.4	O K
30 min Summer	18.797	0.547	26.9	694.7	O K
60 min Summer	18.916	0.666	26.9	875.1	O K
120 min Summer	18.961	0.711	26.9	945.0	O K
180 min Summer	18.974	0.724	26.9	966.5	O K
240 min Summer	18.975	0.725	26.9	967.5	O K
360 min Summer	18.960	0.710	26.9	944.4	O K
480 min Summer	18.945	0.695	26.9	919.8	O K
600 min Summer	18.928	0.678	26.9	893.6	O K
720 min Summer	18.910	0.660	26.9	866.2	O K
960 min Summer	18.875	0.625	26.9	811.0	O K
1440 min Summer	18.806	0.556	26.9	708.3	O K
2160 min Summer	18.714	0.464	26.9	575.3	O K
2880 min Summer	18.639	0.389	26.9	471.1	O K
4320 min Summer	18.537	0.287	26.6	337.0	O K
5760 min Summer	18.482	0.232	26.0	268.6	O K
7200 min Summer	18.460	0.210	23.9	240.8	O K
8640 min Summer	18.445	0.195	22.0	223.5	O K
10080 min Summer	18.435	0.185	20.6	211.1	O K
15 min Winter	18.722	0.472	26.9	586.8	O K
30 min Winter	18.856	0.606	26.9	783.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	532.6	29	
30 min Summer	90.183	0.0	718.6	43	
60 min Summer	57.866	0.0	938.6	72	
120 min Summer	32.885	0.0	1067.6	128	
180 min Summer	23.621	0.0	1150.7	186	
240 min Summer	18.682	0.0	1213.8	242	
360 min Summer	13.435	0.0	1309.6	318	
480 min Summer	10.653	0.0	1384.8	380	
600 min Summer	8.910	0.0	1447.8	442	
720 min Summer	7.706	0.0	1502.6	506	
960 min Summer	6.140	0.0	1596.1	638	
1440 min Summer	4.483	0.0	1746.9	904	
2160 min Summer	3.294	0.0	1936.3	1284	
2880 min Summer	2.663	0.0	2087.0	1648	
4320 min Summer	2.002	0.0	2348.1	2336	
5760 min Summer	1.655	0.0	2598.4	3000	
7200 min Summer	1.442	0.0	2829.4	3688	
8640 min Summer	1.297	0.0	3053.6	4416	
10080 min Summer	1.193	0.0	3272.3	5144	
15 min Winter	134.447	0.0	598.0	29	
30 min Winter	90.183	0.0	806.2	43	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature F 100yr + 40%CC			
Date 07/12/2020 14:10 File Basin F.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	18.987	0.737	26.9	987.6	O K
120 min Winter	19.037	0.787	26.9	1069.4	O K
180 min Winter	19.054	0.804	26.9	1097.8	O K
240 min Winter	19.058	0.808	26.9	1103.4	O K
360 min Winter	19.045	0.795	26.9	1082.1	O K
480 min Winter	19.023	0.773	26.9	1045.7	O K
600 min Winter	19.003	0.753	26.9	1013.9	O K
720 min Winter	18.982	0.732	26.9	979.1	O K
960 min Winter	18.933	0.683	26.9	901.6	O K
1440 min Winter	18.825	0.575	26.9	735.7	O K
2160 min Winter	18.680	0.430	26.9	527.9	O K
2880 min Winter	18.570	0.320	26.8	380.1	O K
4320 min Winter	18.466	0.216	24.7	249.2	O K
5760 min Winter	18.437	0.187	20.9	213.5	O K
7200 min Winter	18.421	0.171	18.4	193.6	O K
8640 min Winter	18.409	0.159	16.6	180.1	O K
10080 min Winter	18.401	0.151	15.3	170.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	1052.0	72	
120 min Winter	32.885	0.0	1196.5	126	
180 min Winter	23.621	0.0	1289.6	182	
240 min Winter	18.682	0.0	1360.3	238	
360 min Winter	13.435	0.0	1467.6	346	
480 min Winter	10.653	0.0	1551.7	400	
600 min Winter	8.910	0.0	1622.3	472	
720 min Winter	7.706	0.0	1683.7	550	
960 min Winter	6.140	0.0	1788.3	704	
1440 min Winter	4.483	0.0	1957.5	978	
2160 min Winter	3.294	0.0	2169.4	1352	
2880 min Winter	2.663	0.0	2338.4	1688	
4320 min Winter	2.002	0.0	2631.7	2296	
5760 min Winter	1.655	0.0	2910.7	3000	
7200 min Winter	1.442	0.0	3169.6	3736	
8640 min Winter	1.297	0.0	3421.1	4416	
10080 min Winter	1.193	0.0	3667.2	5144	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature F 100yr + 40%CC	
Date 07/12/2020 14:10 File Basin F.srcx	Designed by DAB Checked by MWS	
XP Solutions		
Source Control 2019.1		

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 448927 117350	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 2.184

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area				
From:	To:	From:	To:	From:	To:	From:	To:				
0	4	0.546	4	8	0.546	8	12	0.546	12	16	0.546

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature F 100yr + 40%CC	
Date 07/12/2020 14:10 File Basin F.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 19.450

Tank or Pond Structure

Invert Level (m) 18.250

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1076.4	0.401	1361.2	0.801	1662.1	1.200	1978.3
0.101	1146.1	0.501	1434.9	0.901	1739.9		
0.201	1216.8	0.601	1509.7	1.001	1818.6		
0.301	1288.5	0.701	1585.4	1.101	1898.4		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0227-2690-0900-2690
Design Head (m)	0.900
Design Flow (l/s)	26.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	227
Invert Level (m)	18.250
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	26.9
Flush-Flo™	0.357	26.9
Kick-Flo®	0.682	23.6
Mean Flow over Head Range	-	22.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.6	1.200	30.9	3.000	48.0	7.000	72.4
0.200	22.6	1.400	33.2	3.500	51.7	7.500	74.9
0.300	26.7	1.600	35.4	4.000	55.2	8.000	77.3
0.400	26.8	1.800	37.5	4.500	58.4	8.500	79.6
0.500	26.3	2.000	39.5	5.000	61.5	9.000	81.8
0.600	25.3	2.200	41.3	5.500	64.4	9.500	83.6
0.800	25.4	2.400	43.1	6.000	67.2		
1.000	28.3	2.600	44.8	6.500	69.8		

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature G 1 year			
Date 07/12/2020 14:14 File Basin G.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	21.473	0.073	22.1	141.0	O K
30 min Summer	21.493	0.093	26.2	180.1	O K
60 min Summer	21.509	0.109	29.6	212.7	O K
120 min Summer	21.519	0.119	31.6	232.2	O K
180 min Summer	21.522	0.122	32.0	237.8	O K
240 min Summer	21.522	0.122	32.0	237.7	O K
360 min Summer	21.517	0.117	31.1	228.0	O K
480 min Summer	21.512	0.112	30.1	217.2	O K
600 min Summer	21.506	0.106	29.0	207.0	O K
720 min Summer	21.502	0.102	28.1	197.3	O K
960 min Summer	21.493	0.093	26.2	179.8	O K
1440 min Summer	21.478	0.078	23.3	151.6	O K
2160 min Summer	21.462	0.062	20.0	120.0	O K
2880 min Summer	21.451	0.051	17.7	97.2	O K
4320 min Summer	21.434	0.034	14.5	65.4	O K
5760 min Summer	21.423	0.023	12.5	44.3	O K
7200 min Summer	21.415	0.015	11.0	28.3	O K
8640 min Summer	21.409	0.009	10.0	16.6	O K
10080 min Summer	21.404	0.004	9.1	7.6	O K
15 min Winter	21.482	0.082	24.1	159.4	O K
30 min Winter	21.505	0.105	28.7	204.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	164.9	27	
30 min Summer	19.618	0.0	219.7	38	
60 min Summer	12.728	0.0	285.5	62	
120 min Summer	8.110	0.0	363.9	94	
180 min Summer	6.206	0.0	417.4	130	
240 min Summer	5.126	0.0	460.6	164	
360 min Summer	3.877	0.0	521.6	232	
480 min Summer	3.179	0.0	570.7	298	
600 min Summer	2.725	0.0	612.3	364	
720 min Summer	2.403	0.0	647.8	430	
960 min Summer	1.972	0.0	708.3	558	
1440 min Summer	1.492	0.0	804.2	808	
2160 min Summer	1.128	0.0	912.0	1176	
2880 min Summer	0.925	0.0	997.4	1540	
4320 min Summer	0.700	0.0	1132.1	2260	
5760 min Summer	0.575	0.0	1239.6	3000	
7200 min Summer	0.492	0.0	1328.1	3744	
8640 min Summer	0.433	0.0	1401.9	4416	
10080 min Summer	0.389	0.0	1467.9	5152	
15 min Winter	29.494	0.0	184.7	27	
30 min Winter	19.618	0.0	246.0	38	
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PFA Consulting Ltd		Page 2
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature G 1 year	
Date 07/12/2020 14:14 File Basin G.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Winter	21.524	0.124	32.5	242.5	O K
120 min Winter	21.535	0.135	34.4	263.5	O K
180 min Winter	21.537	0.137	34.7	267.2	O K
240 min Winter	21.535	0.135	34.4	263.9	O K
360 min Winter	21.526	0.126	32.8	246.7	O K
480 min Winter	21.517	0.117	31.2	228.4	O K
600 min Winter	21.509	0.109	29.5	211.5	O K
720 min Winter	21.501	0.101	28.0	197.0	O K
960 min Winter	21.489	0.089	25.4	172.0	O K
1440 min Winter	21.470	0.070	21.5	134.4	O K
2160 min Winter	21.450	0.050	17.5	96.2	O K
2880 min Winter	21.437	0.037	15.0	70.2	O K
4320 min Winter	21.419	0.019	11.8	36.6	O K
5760 min Winter	21.408	0.008	9.9	15.3	O K
7200 min Winter	21.401	0.001	8.7	1.0	O K
8640 min Winter	21.400	0.000	7.7	0.0	O K
10080 min Winter	21.400	0.000	6.9	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	12.728	0.0	319.0	62
120 min Winter	8.110	0.0	407.1	100
180 min Winter	6.206	0.0	467.7	138
240 min Winter	5.126	0.0	515.7	174
360 min Winter	3.877	0.0	585.0	248
480 min Winter	3.179	0.0	639.8	316
600 min Winter	2.725	0.0	685.3	386
720 min Winter	2.403	0.0	724.9	452
960 min Winter	1.972	0.0	793.8	582
1440 min Winter	1.492	0.0	901.2	836
2160 min Winter	1.128	0.0	1021.0	1216
2880 min Winter	0.925	0.0	1116.7	1584
4320 min Winter	0.700	0.0	1268.0	2304
5760 min Winter	0.575	0.0	1388.6	3008
7200 min Winter	0.492	0.0	1488.1	3680
8640 min Winter	0.433	0.0	1571.1	0
10080 min Winter	0.389	0.0	1645.1	0

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature G 1 year	
Date 07/12/2020 14:14 File Basin G.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 2.998

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.750	4 8	0.750	8 12	0.750	12 16	0.748

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature G 1 year	
Date 07/12/2020 14:14 File Basin G.srcx	Designed by DAB Checked by MWS	
XP Solutions Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 22.400

Tank or Pond Structure

Invert Level (m) 21.400

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1904.7	0.301	2137.6	0.601	2379.6	0.901	2630.6
0.101	1981.3	0.401	2217.3	0.701	2462.3	1.000	2715.5
0.201	2058.9	0.501	2297.9	0.801	2546.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SFF-0269-4140-1000-4040
Design Head (m)	1.000
Design Flow (l/s)	41.4
Flush-Flo™	User Defined
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	269
Invert Level (m)	21.300
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	41.4
Flush-Flo™	0.411	40.3
Kick-Flo®	0.737	35.8
Mean Flow over Head Range	-	33.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.5	1.200	45.2	3.000	70.4	7.000	106.3
0.200	27.7	1.400	48.7	3.500	75.9	7.500	110.0
0.300	39.6	1.600	51.9	4.000	80.9	8.000	113.5
0.400	40.3	1.800	55.0	4.500	85.7	8.500	116.9
0.500	40.0	2.000	57.8	5.000	90.2	9.000	120.2
0.600	39.0	2.200	60.6	5.500	94.5	9.500	123.5
0.800	37.2	2.400	63.2	6.000	98.6		
1.000	41.4	2.600	65.7	6.500	102.6		

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PFA Consulting Ltd					Page 1
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature G 100yr + 40%CC			
Date 07/12/2020 14:16 File Basin G.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	21.746	0.346	40.3	704.2	O K
30 min Summer	21.851	0.451	40.3	936.7	O K
60 min Summer	21.953	0.553	40.3	1171.9	O K
120 min Summer	21.984	0.584	40.3	1246.2	O K
180 min Summer	21.989	0.589	40.3	1256.5	O K
240 min Summer	21.982	0.582	40.3	1239.5	O K
360 min Summer	21.959	0.559	40.3	1186.4	O K
480 min Summer	21.939	0.539	40.3	1138.3	O K
600 min Summer	21.919	0.519	40.3	1092.6	O K
720 min Summer	21.899	0.499	40.3	1048.0	O K
960 min Summer	21.862	0.462	40.3	963.2	O K
1440 min Summer	21.796	0.396	40.3	814.8	O K
2160 min Summer	21.714	0.314	40.3	636.0	O K
2880 min Summer	21.652	0.252	40.1	504.6	O K
4320 min Summer	21.575	0.175	39.1	345.6	O K
5760 min Summer	21.542	0.142	35.6	278.9	O K
7200 min Summer	21.523	0.123	32.2	239.1	O K
8640 min Summer	21.510	0.110	29.7	213.6	O K
10080 min Summer	21.500	0.100	27.8	194.9	O K
15 min Winter	21.787	0.387	40.3	793.9	O K
30 min Winter	21.904	0.504	40.3	1058.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	754.8	29	
30 min Summer	90.183	0.0	1012.6	43	
60 min Summer	57.866	0.0	1299.4	72	
120 min Summer	32.885	0.0	1478.1	128	
180 min Summer	23.621	0.0	1592.1	184	
240 min Summer	18.682	0.0	1679.7	240	
360 min Summer	13.435	0.0	1811.8	298	
480 min Summer	10.653	0.0	1914.9	358	
600 min Summer	8.910	0.0	2002.8	422	
720 min Summer	7.706	0.0	2077.9	490	
960 min Summer	6.140	0.0	2207.3	624	
1440 min Summer	4.483	0.0	2418.2	888	
2160 min Summer	3.294	0.0	2665.1	1264	
2880 min Summer	2.663	0.0	2873.5	1620	
4320 min Summer	2.002	0.0	3240.0	2300	
5760 min Summer	1.655	0.0	3570.4	3000	
7200 min Summer	1.442	0.0	3889.9	3744	
8640 min Summer	1.297	0.0	4199.9	4416	
10080 min Summer	1.193	0.0	4507.2	5152	
15 min Winter	134.447	0.0	845.3	29	
30 min Winter	90.183	0.0	1134.7	43	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature G 100yr + 40%CC			
Date 07/12/2020 14:16 File Basin G.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	22.019	0.619	40.3	1329.2	O K
120 min Winter	22.059	0.659	40.3	1425.6	O K
180 min Winter	22.069	0.669	40.3	1449.7	O K
240 min Winter	22.067	0.667	40.3	1443.5	O K
360 min Winter	22.044	0.644	40.3	1388.9	O K
480 min Winter	22.014	0.614	40.3	1317.4	O K
600 min Winter	21.988	0.588	40.3	1254.1	O K
720 min Winter	21.960	0.560	40.3	1189.3	O K
960 min Winter	21.905	0.505	40.3	1060.8	O K
1440 min Winter	21.803	0.403	40.3	829.5	O K
2160 min Winter	21.678	0.278	40.3	559.8	O K
2880 min Winter	21.594	0.194	39.5	384.8	O K
4320 min Winter	21.531	0.131	33.7	255.0	O K
5760 min Winter	21.503	0.103	28.4	200.9	O K
7200 min Winter	21.487	0.087	25.0	168.0	O K
8640 min Winter	21.475	0.075	22.6	145.0	O K
10080 min Winter	21.467	0.067	20.9	128.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	1456.1	70	
120 min Winter	32.885	0.0	1655.3	126	
180 min Winter	23.621	0.0	1783.4	182	
240 min Winter	18.682	0.0	1880.5	238	
360 min Winter	13.435	0.0	2028.8	344	
480 min Winter	10.653	0.0	2145.7	390	
600 min Winter	8.910	0.0	2242.3	462	
720 min Winter	7.706	0.0	2328.1	536	
960 min Winter	6.140	0.0	2473.0	682	
1440 min Winter	4.483	0.0	2707.8	954	
2160 min Winter	3.294	0.0	2986.2	1324	
2880 min Winter	2.663	0.0	3218.5	1648	
4320 min Winter	2.002	0.0	3628.7	2304	
5760 min Winter	1.655	0.0	3999.1	3008	
7200 min Winter	1.442	0.0	4356.1	3752	
8640 min Winter	1.297	0.0	4704.0	4424	
10080 min Winter	1.193	0.0	5048.1	5152	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature G 100yr + 40%CC	
Date 07/12/2020 14:16 File Basin G.srcx	Designed by DAB Checked by MWS	
XP Solutions		Source Control 2019.1

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 448927 117350	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 2.998

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.750	4 8 0.750	8 12 0.750	12 16 0.748				

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature G 100yr + 40%CC	
Date 07/12/2020 14:16 File Basin G.srcx	Designed by DAB Checked by MWS	
XP Solutions Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 22.400

Tank or Pond Structure

Invert Level (m) 21.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1904.7	0.301	2137.6	0.601	2379.6	0.901	2630.6
0.101	1981.3	0.401	2217.3	0.701	2462.3	1.000	2715.5
0.201	2058.9	0.501	2297.9	0.801	2546.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SFF-0269-4140-1000-4040
Design Head (m)	1.000
Design Flow (l/s)	41.4
Flush-Flo™	User Defined
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	269
Invert Level (m)	21.300
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	41.4
Flush-Flo™	0.411	40.3
Kick-Flo®	0.737	35.8
Mean Flow over Head Range	-	33.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.5	1.200	45.2	3.000	70.4	7.000	106.3
0.200	27.7	1.400	48.7	3.500	75.9	7.500	110.0
0.300	39.6	1.600	51.9	4.000	80.9	8.000	113.5
0.400	40.3	1.800	55.0	4.500	85.7	8.500	116.9
0.500	40.0	2.000	57.8	5.000	90.2	9.000	120.2
0.600	39.0	2.200	60.6	5.500	94.5	9.500	123.5
0.800	37.2	2.400	63.2	6.000	98.6		
1.000	41.4	2.600	65.7	6.500	102.6		

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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature H 1 year			
Date 07/12/2020 14:49 File Basin H.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.800	0.100	10.0	287.4	O K
30 min Summer	18.830	0.130	16.2	374.4	O K
60 min Summer	18.860	0.160	23.7	465.6	O K
120 min Summer	18.886	0.186	30.7	543.4	O K
180 min Summer	18.898	0.198	34.1	579.3	O K
240 min Summer	18.906	0.206	36.6	604.7	O K
360 min Summer	18.914	0.214	38.9	630.2	O K
480 min Summer	18.918	0.218	40.1	641.5	O K
600 min Summer	18.919	0.219	40.4	644.9	O K
720 min Summer	18.919	0.219	40.2	643.7	O K
960 min Summer	18.916	0.216	39.3	634.4	O K
1440 min Summer	18.907	0.207	36.7	606.4	O K
2160 min Summer	18.893	0.193	32.7	563.7	O K
2880 min Summer	18.881	0.181	29.3	528.0	O K
4320 min Summer	18.863	0.163	24.5	474.7	O K
5760 min Summer	18.850	0.150	21.2	436.5	O K
7200 min Summer	18.841	0.141	18.8	407.7	O K
8640 min Summer	18.833	0.133	16.9	383.9	O K
10080 min Summer	18.826	0.126	15.4	364.2	O K
15 min Winter	18.812	0.112	12.3	321.3	O K
30 min Winter	18.844	0.144	19.7	418.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	226.2	30	
30 min Summer	19.618	0.0	318.3	43	
60 min Summer	12.728	0.0	467.9	68	
120 min Summer	8.110	0.0	606.0	120	
180 min Summer	6.206	0.0	700.7	148	
240 min Summer	5.126	0.0	775.3	178	
360 min Summer	3.877	0.0	883.7	244	
480 min Summer	3.179	0.0	968.8	312	
600 min Summer	2.725	0.0	1039.9	378	
720 min Summer	2.403	0.0	1101.5	444	
960 min Summer	1.972	0.0	1205.4	574	
1440 min Summer	1.492	0.0	1364.9	826	
2160 min Summer	1.128	0.0	1593.0	1196	
2880 min Summer	0.925	0.0	1739.3	1564	
4320 min Summer	0.700	0.0	1958.9	2296	
5760 min Summer	0.575	0.0	2187.8	3008	
7200 min Summer	0.492	0.0	2339.1	3752	
8640 min Summer	0.433	0.0	2462.9	4496	
10080 min Summer	0.389	0.0	2563.7	5240	
15 min Winter	29.494	0.0	259.5	29	
30 min Winter	19.618	0.0	363.5	42	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature H 1 year			
Date 07/12/2020 14:49 File Basin H.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	18.878	0.178	28.6	519.8	O K
120 min Winter	18.907	0.207	36.7	606.5	O K
180 min Winter	18.919	0.219	40.2	643.3	O K
240 min Winter	18.926	0.226	42.4	667.2	O K
360 min Winter	18.932	0.232	44.1	683.1	O K
480 min Winter	18.932	0.232	44.1	683.1	O K
600 min Winter	18.929	0.229	43.3	675.9	O K
720 min Winter	18.926	0.226	42.3	665.4	O K
960 min Winter	18.918	0.218	39.9	640.8	O K
1440 min Winter	18.902	0.202	35.4	592.3	O K
2160 min Winter	18.882	0.182	29.7	532.9	O K
2880 min Winter	18.868	0.168	25.7	488.4	O K
4320 min Winter	18.847	0.147	20.4	427.7	O K
5760 min Winter	18.834	0.134	17.1	387.4	O K
7200 min Winter	18.824	0.124	14.9	357.9	O K
8640 min Winter	18.816	0.116	13.2	334.7	O K
10080 min Winter	18.810	0.110	11.9	316.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	12.728	0.0	528.5	68	
120 min Winter	8.110	0.0	683.3	118	
180 min Winter	6.206	0.0	789.6	150	
240 min Winter	5.126	0.0	873.3	186	
360 min Winter	3.877	0.0	994.8	260	
480 min Winter	3.179	0.0	1090.3	332	
600 min Winter	2.725	0.0	1170.1	402	
720 min Winter	2.403	0.0	1239.3	470	
960 min Winter	1.972	0.0	1356.1	604	
1440 min Winter	1.492	0.0	1535.8	860	
2160 min Winter	1.128	0.0	1787.5	1240	
2880 min Winter	0.925	0.0	1952.0	1612	
4320 min Winter	0.700	0.0	2200.6	2344	
5760 min Winter	0.575	0.0	2452.5	3064	
7200 min Winter	0.492	0.0	2622.8	3824	
8640 min Winter	0.433	0.0	2762.6	4504	
10080 min Winter	0.389	0.0	2878.5	5256	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature H 1 year	
Date 07/12/2020 14:49 File Basin H.srcx	Designed by DAB Checked by MWS	
XP Solutions		Source Control 2019.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 5.330

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	1.332	4 8	1.332	8 12	1.332	12 16	1.334

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature H 1 year	
Date 07/12/2020 14:49 File Basin H.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 19.900

Tank or Pond Structure

Invert Level (m) 18.700

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	2816.2	0.401	3284.4	0.801	3768.6	1.200	4267.6
0.101	2931.7	0.501	3404.0	0.901	3892.2		
0.201	3048.3	0.601	3524.5	1.001	4016.7		
0.301	3165.8	0.701	3646.1	1.101	4142.3		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0342-7080-0900-7080
Design Head (m)	0.900
Design Flow (l/s)	70.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	342
Invert Level (m)	18.700
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	70.8
Flush-Flo™	0.486	70.8
Kick-Flo®	0.758	65.1
Mean Flow over Head Range	-	54.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	10.0	1.200	81.4	3.000	127.0	7.000	192.3
0.200	34.7	1.400	87.7	3.500	137.0	7.500	198.9
0.300	63.2	1.600	93.6	4.000	146.2	8.000	205.3
0.400	70.1	1.800	99.1	4.500	154.9	8.500	211.5
0.500	70.8	2.000	104.3	5.000	163.1	9.000	217.6
0.600	69.8	2.200	109.2	5.500	170.9	9.500	221.5
0.800	66.9	2.400	114.0	6.000	178.3		
1.000	74.5	2.600	118.5	6.500	185.4		

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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature H 100yr + 40%CC			
Date 07/12/2020 14:52 File Basin H.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	19.118	0.418	70.4	1278.3	O K
30 min Summer	19.242	0.542	70.8	1696.6	O K
60 min Summer	19.365	0.665	70.8	2131.6	O K
120 min Summer	19.412	0.712	70.8	2300.4	O K
180 min Summer	19.426	0.726	70.8	2353.0	O K
240 min Summer	19.426	0.726	70.8	2354.3	O K
360 min Summer	19.415	0.715	70.8	2313.0	O K
480 min Summer	19.403	0.703	70.8	2269.3	O K
600 min Summer	19.390	0.690	70.8	2220.9	O K
720 min Summer	19.375	0.675	70.8	2167.4	O K
960 min Summer	19.343	0.643	70.8	2052.5	O K
1440 min Summer	19.279	0.579	70.8	1824.3	O K
2160 min Summer	19.191	0.491	70.8	1524.0	O K
2880 min Summer	19.123	0.423	70.4	1295.4	O K
4320 min Summer	19.036	0.336	68.5	1013.0	O K
5760 min Summer	18.998	0.298	62.8	890.9	O K
7200 min Summer	18.975	0.275	56.8	819.1	O K
8640 min Summer	18.960	0.260	52.3	770.4	O K
10080 min Summer	18.949	0.249	49.1	735.4	O K
15 min Winter	19.165	0.465	70.8	1436.2	O K
30 min Winter	19.303	0.603	70.8	1910.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	1251.5	29	
30 min Summer	90.183	0.0	1702.1	43	
60 min Summer	57.866	0.0	2264.5	72	
120 min Summer	32.885	0.0	2578.4	128	
180 min Summer	23.621	0.0	2780.5	184	
240 min Summer	18.682	0.0	2933.7	240	
360 min Summer	13.435	0.0	3166.4	298	
480 min Summer	10.653	0.0	3348.7	360	
600 min Summer	8.910	0.0	3501.3	424	
720 min Summer	7.706	0.0	3634.1	492	
960 min Summer	6.140	0.0	3859.6	626	
1440 min Summer	4.483	0.0	4221.1	890	
2160 min Summer	3.294	0.0	4708.1	1264	
2880 min Summer	2.663	0.0	5072.6	1620	
4320 min Summer	2.002	0.0	5696.3	2300	
5760 min Summer	1.655	0.0	6330.6	3000	
7200 min Summer	1.442	0.0	6891.4	3744	
8640 min Summer	1.297	0.0	7433.5	4424	
10080 min Summer	1.193	0.0	7955.7	5152	
15 min Winter	134.447	0.0	1410.2	29	
30 min Winter	90.183	0.0	1914.1	43	
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PFA Consulting Ltd					Page 2
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature H 100yr + 40%CC			
Date 07/12/2020 14:52 File Basin H.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	19.441	0.741	70.8	2407.6	O K
120 min Winter	19.495	0.795	70.8	2610.0	O K
180 min Winter	19.514	0.814	70.8	2680.4	O K
240 min Winter	19.517	0.817	70.8	2694.1	O K
360 min Winter	19.504	0.804	70.8	2642.4	O K
480 min Winter	19.484	0.784	70.8	2569.9	O K
600 min Winter	19.465	0.765	70.8	2497.7	O K
720 min Winter	19.442	0.742	70.8	2412.0	O K
960 min Winter	19.391	0.691	70.8	2224.7	O K
1440 min Winter	19.288	0.588	70.8	1856.4	O K
2160 min Winter	19.154	0.454	70.7	1398.8	O K
2880 min Winter	19.061	0.361	69.3	1090.5	O K
4320 min Winter	18.985	0.285	59.4	849.7	O K
5760 min Winter	18.953	0.253	50.2	749.0	O K
7200 min Winter	18.933	0.233	44.4	686.1	O K
8640 min Winter	18.918	0.218	40.1	642.4	O K
10080 min Winter	18.908	0.208	37.0	610.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	2540.8	70	
120 min Winter	32.885	0.0	2892.3	126	
180 min Winter	23.621	0.0	3118.6	182	
240 min Winter	18.682	0.0	3290.2	238	
360 min Winter	13.435	0.0	3550.8	342	
480 min Winter	10.653	0.0	3754.9	388	
600 min Winter	8.910	0.0	3925.9	464	
720 min Winter	7.706	0.0	4074.7	540	
960 min Winter	6.140	0.0	4327.7	684	
1440 min Winter	4.483	0.0	4734.5	956	
2160 min Winter	3.294	0.0	5276.8	1328	
2880 min Winter	2.663	0.0	5685.9	1652	
4320 min Winter	2.002	0.0	6388.7	2332	
5760 min Winter	1.655	0.0	7092.8	3056	
7200 min Winter	1.442	0.0	7721.8	3752	
8640 min Winter	1.297	0.0	8330.8	4496	
10080 min Winter	1.193	0.0	8920.9	5240	
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PFA Consulting Ltd		Page 4																																																																																																																															
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Model Details Storage is Online Cover Level (m) 19.900 Tank or Pond Structure Invert Level (m) 18.700 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>2816.2</td><td>0.401</td><td>3284.4</td><td>0.801</td><td>3768.6</td><td>1.200</td><td>4267.6</td></tr><tr><td>0.101</td><td>2931.7</td><td>0.501</td><td>3404.0</td><td>0.901</td><td>3892.2</td><td></td><td></td></tr><tr><td>0.201</td><td>3048.3</td><td>0.601</td><td>3524.5</td><td>1.001</td><td>4016.7</td><td></td><td></td></tr><tr><td>0.301</td><td>3165.8</td><td>0.701</td><td>3646.1</td><td>1.101</td><td>4142.3</td><td></td><td></td></tr></tbody></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SHE-0342-7080-0900-7080 Design Head (m) 0.900 Design Flow (l/s) 70.8 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 342 Invert Level (m) 18.700 Minimum Outlet Pipe Diameter (mm) 375 Suggested Manhole Diameter (mm) 2100 <table><thead><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>Design Point (Calculated)</td><td>0.900</td><td>70.8</td></tr><tr><td>Flush-Flo™</td><td>0.486</td><td>70.8</td></tr><tr><td>Kick-Flo®</td><td>0.758</td><td>65.1</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>54.2</td></tr></tbody></table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>10.0</td><td>1.200</td><td>81.4</td><td>3.000</td><td>127.0</td><td>7.000</td><td>192.3</td></tr><tr><td>0.200</td><td>34.7</td><td>1.400</td><td>87.7</td><td>3.500</td><td>137.0</td><td>7.500</td><td>198.9</td></tr><tr><td>0.300</td><td>63.2</td><td>1.600</td><td>93.6</td><td>4.000</td><td>146.2</td><td>8.000</td><td>205.3</td></tr><tr><td>0.400</td><td>70.1</td><td>1.800</td><td>99.1</td><td>4.500</td><td>154.9</td><td>8.500</td><td>211.5</td></tr><tr><td>0.500</td><td>70.8</td><td>2.000</td><td>104.3</td><td>5.000</td><td>163.1</td><td>9.000</td><td>217.6</td></tr><tr><td>0.600</td><td>69.8</td><td>2.200</td><td>109.2</td><td>5.500</td><td>170.9</td><td>9.500</td><td>221.5</td></tr><tr><td>0.800</td><td>66.9</td><td>2.400</td><td>114.0</td><td>6.000</td><td>178.3</td><td></td><td></td></tr><tr><td>1.000</td><td>74.5</td><td>2.600</td><td>118.5</td><td>6.500</td><td>185.4</td><td></td><td></td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	2816.2	0.401	3284.4	0.801	3768.6	1.200	4267.6	0.101	2931.7	0.501	3404.0	0.901	3892.2			0.201	3048.3	0.601	3524.5	1.001	4016.7			0.301	3165.8	0.701	3646.1	1.101	4142.3			Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	0.900	70.8	Flush-Flo™	0.486	70.8	Kick-Flo®	0.758	65.1	Mean Flow over Head Range	-	54.2	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	10.0	1.200	81.4	3.000	127.0	7.000	192.3	0.200	34.7	1.400	87.7	3.500	137.0	7.500	198.9	0.300	63.2	1.600	93.6	4.000	146.2	8.000	205.3	0.400	70.1	1.800	99.1	4.500	154.9	8.500	211.5	0.500	70.8	2.000	104.3	5.000	163.1	9.000	217.6	0.600	69.8	2.200	109.2	5.500	170.9	9.500	221.5	0.800	66.9	2.400	114.0	6.000	178.3			1.000	74.5	2.600	118.5	6.500	185.4		
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Summer</td><td>3.877</td><td>0.0</td><td>411.5</td><td>252</td></tr><tr><td>480 min Summer</td><td>3.179</td><td>0.0</td><td>450.3</td><td>314</td></tr><tr><td>600 min Summer</td><td>2.725</td><td>0.0</td><td>482.8</td><td>376</td></tr><tr><td>720 min Summer</td><td>2.403</td><td>0.0</td><td>511.1</td><td>440</td></tr><tr><td>960 min Summer</td><td>1.972</td><td>0.0</td><td>558.9</td><td>564</td></tr><tr><td>1440 min Summer</td><td>1.492</td><td>0.0</td><td>633.5</td><td>808</td></tr><tr><td>2160 min Summer</td><td>1.128</td><td>0.0</td><td>726.1</td><td>1172</td></tr><tr><td>2880 min Summer</td><td>0.925</td><td>0.0</td><td>793.3</td><td>1532</td></tr><tr><td>4320 min Summer</td><td>0.700</td><td>0.0</td><td>896.9</td><td>2256</td></tr><tr><td>5760 min Summer</td><td>0.575</td><td>0.0</td><td>990.8</td><td>2992</td></tr><tr><td>7200 min Summer</td><td>0.492</td><td>0.0</td><td>1060.2</td><td>3712</td></tr><tr><td>8640 min 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Summer	20.602	0.102	8.1	97.1	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	29.494	0.0	119.8	69	30 min Summer	19.618	0.0	163.3	72	60 min Summer	12.728	0.0	222.5	90	120 min Summer	8.110	0.0	285.3	126	180 min Summer	6.206	0.0	328.3	164	240 min Summer	5.126	0.0	362.2	192	360 min Summer	3.877	0.0	411.5	252	480 min Summer	3.179	0.0	450.3	314	600 min Summer	2.725	0.0	482.8	376	720 min Summer	2.403	0.0	511.1	440	960 min Summer	1.972	0.0	558.9	564	1440 min Summer	1.492	0.0	633.5	808	2160 min Summer	1.128	0.0	726.1	1172	2880 min Summer	0.925	0.0	793.3	1532	4320 min Summer	0.700	0.0	896.9	2256	5760 min Summer	0.575	0.0	990.8	2992	7200 min Summer	0.492	0.0	1060.2	3712	8640 min Summer	0.433	0.0	1117.8	4424
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4320 min Summer	20.630	0.130	12.2	124.1	O K																																																																																																																																																																																																																													
5760 min Summer	20.618	0.118	10.3	112.4	O K																																																																																																																																																																																																																													
7200 min Summer	20.609	0.109	9.1	103.7	O K																																																																																																																																																																																																																													
8640 min Summer	20.602	0.102	8.1	97.1	O K																																																																																																																																																																																																																													
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																														
15 min Summer	29.494	0.0	119.8	69																																																																																																																																																																																																																														
30 min Summer	19.618	0.0	163.3	72																																																																																																																																																																																																																														
60 min Summer	12.728	0.0	222.5	90																																																																																																																																																																																																																														
120 min Summer	8.110	0.0	285.3	126																																																																																																																																																																																																																														
180 min Summer	6.206	0.0	328.3	164																																																																																																																																																																																																																														
240 min Summer	5.126	0.0	362.2	192																																																																																																																																																																																																																														
360 min Summer	3.877	0.0	411.5	252																																																																																																																																																																																																																														
480 min Summer	3.179	0.0	450.3	314																																																																																																																																																																																																																														
600 min Summer	2.725	0.0	482.8	376																																																																																																																																																																																																																														
720 min Summer	2.403	0.0	511.1	440																																																																																																																																																																																																																														
960 min Summer	1.972	0.0	558.9	564																																																																																																																																																																																																																														
1440 min Summer	1.492	0.0	633.5	808																																																																																																																																																																																																																														
2160 min Summer	1.128	0.0	726.1	1172																																																																																																																																																																																																																														
2880 min Summer	0.925	0.0	793.3	1532																																																																																																																																																																																																																														
4320 min Summer	0.700	0.0	896.9	2256																																																																																																																																																																																																																														
5760 min Summer	0.575	0.0	990.8	2992																																																																																																																																																																																																																														
7200 min Summer	0.492	0.0	1060.2	3712																																																																																																																																																																																																																														
8640 min Summer	0.433	0.0	1117.8	4424																																																																																																																																																																																																																														
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PFA Consulting				Page 2	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature I 100 year + 40%CC			
Date 03/11/2020 14:58 File Basin I and J.CASX		Designed by DAB Checked by MWS			
Causeway		Source Control 2019.1			
<u>Cascade Summary of Results for Basin I.srcx</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	20.597	0.097	7.4	91.8	O K
15 min Winter	20.603	0.103	8.1	97.6	O K
30 min Winter	20.633	0.133	12.7	127.0	O K
60 min Winter	20.664	0.164	17.9	158.9	O K
120 min Winter	20.698	0.198	23.3	193.8	O K
180 min Winter	20.714	0.214	25.5	210.1	O K
240 min Winter	20.721	0.221	26.4	217.4	O K
360 min Winter	20.723	0.223	26.7	219.9	O K
480 min Winter	20.719	0.219	26.1	214.9	O K
600 min Winter	20.711	0.211	25.1	207.3	O K
720 min Winter	20.704	0.204	24.1	199.3	O K
960 min Winter	20.689	0.189	22.0	184.5	O K
1440 min Winter	20.667	0.167	18.4	161.9	O K
2160 min Winter	20.645	0.145	14.7	139.7	O K
2880 min Winter	20.631	0.131	12.5	125.4	O K
4320 min Winter	20.613	0.113	9.6	107.5	O K
5760 min Winter	20.602	0.102	8.0	96.3	O K
7200 min Winter	20.594	0.094	6.9	88.5	O K
8640 min Winter	20.587	0.087	6.0	82.5	O K
10080 min Winter	20.583	0.083	5.5	77.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
10080 min Summer	0.389	0.0	1166.7	5152	
15 min Winter	29.494	0.0	135.7	67	
30 min Winter	19.618	0.0	184.4	73	
60 min Winter	12.728	0.0	250.0	92	
120 min Winter	8.110	0.0	320.3	128	
180 min Winter	6.206	0.0	368.5	170	
240 min Winter	5.126	0.0	406.5	196	
360 min Winter	3.877	0.0	461.8	262	
480 min Winter	3.179	0.0	505.3	328	
600 min Winter	2.725	0.0	541.7	392	
720 min Winter	2.403	0.0	573.4	456	
960 min Winter	1.972	0.0	627.1	582	
1440 min Winter	1.492	0.0	710.9	828	
2160 min Winter	1.128	0.0	813.8	1192	
2880 min Winter	0.925	0.0	889.3	1560	
4320 min Winter	0.700	0.0	1006.0	2296	
5760 min Winter	0.575	0.0	1110.0	3000	
7200 min Winter	0.492	0.0	1187.9	3712	
8640 min Winter	0.433	0.0	1252.8	4488	
10080 min Winter	0.389	0.0	1308.5	5144	
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PFA Consulting		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature I 100 year + 40%CC	
Date 03/11/2020 14:58 File Basin I and J.CASX	Designed by DAB Checked by MWS	
Causeway	Source Control 2019.1	

Cascade Rainfall Details for Basin I.srcx

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.011

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 4	0.501	4 8	0.510

PFA Consulting		Page 4																																																																																																																																																					
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<u>Cascade Model Details for Basin I.srcx</u> Storage is Online Cover Level (m) 21.700 <u>Tank or Pond Structure</u> Invert Level (m) 20.500 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>918.6</td><td>0.401</td><td>1160.9</td><td>0.801</td><td>1419.2</td><td>1.200</td><td>1692.9</td></tr><tr><td>0.101</td><td>977.6</td><td>0.501</td><td>1224.0</td><td>0.901</td><td>1486.3</td><td></td><td></td></tr><tr><td>0.201</td><td>1037.7</td><td>0.601</td><td>1288.1</td><td>1.001</td><td>1554.4</td><td></td><td></td></tr><tr><td>0.301</td><td>1098.8</td><td>0.701</td><td>1353.1</td><td>1.101</td><td>1623.5</td><td></td><td></td></tr></table> <u>Hydro-Brake® Optimum Outflow Control</u> <table><tr><td>Unit Reference</td><td>MD-SFF-0234-2960-0900-2870</td></tr><tr><td>Design Head (m)</td><td>0.900</td></tr><tr><td>Design Flow (l/s)</td><td>29.6</td></tr><tr><td>Flush-Flo™</td><td>User Defined</td></tr><tr><td>Objective</td><td>Minimise upstream storage</td></tr><tr><td>Application</td><td>Surface</td></tr><tr><td>Sump Available</td><td>Yes</td></tr><tr><td>Diameter (mm)</td><td>234</td></tr><tr><td>Invert Level (m)</td><td>20.500</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td>300</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td>1500</td></tr></table> <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>0.900</td><td>29.6</td></tr><tr><td>Flush-Flo™</td><td>0.360</td><td>28.7</td></tr><tr><td>Kick-Flo®</td><td>0.653</td><td>25.4</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>23.6</td></tr></table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>7.7</td><td>1.200</td><td>34.0</td><td>3.000</td><td>52.8</td><td>7.000</td><td>79.7</td></tr><tr><td>0.200</td><td>23.6</td><td>1.400</td><td>36.6</td><td>3.500</td><td>56.9</td><td>7.500</td><td>82.5</td></tr><tr><td>0.300</td><td>28.5</td><td>1.600</td><td>39.0</td><td>4.000</td><td>60.7</td><td>8.000</td><td>85.1</td></tr><tr><td>0.400</td><td>28.6</td><td>1.800</td><td>41.3</td><td>4.500</td><td>64.3</td><td>8.500</td><td>87.7</td></tr><tr><td>0.500</td><td>28.0</td><td>2.000</td><td>43.4</td><td>5.000</td><td>67.7</td><td>9.000</td><td>90.1</td></tr><tr><td>0.600</td><td>26.7</td><td>2.200</td><td>45.5</td><td>5.500</td><td>70.9</td><td>9.500</td><td>92.1</td></tr><tr><td>0.800</td><td>28.0</td><td>2.400</td><td>47.4</td><td>6.000</td><td>74.0</td><td></td><td></td></tr><tr><td>1.000</td><td>31.1</td><td>2.600</td><td>49.3</td><td>6.500</td><td>76.9</td><td></td><td></td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	918.6	0.401	1160.9	0.801	1419.2	1.200	1692.9	0.101	977.6	0.501	1224.0	0.901	1486.3			0.201	1037.7	0.601	1288.1	1.001	1554.4			0.301	1098.8	0.701	1353.1	1.101	1623.5			Unit Reference	MD-SFF-0234-2960-0900-2870	Design Head (m)	0.900	Design Flow (l/s)	29.6	Flush-Flo™	User Defined	Objective	Minimise upstream storage	Application	Surface	Sump Available	Yes	Diameter (mm)	234	Invert Level (m)	20.500	Minimum Outlet Pipe Diameter (mm)	300	Suggested Manhole Diameter (mm)	1500	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	0.900	29.6	Flush-Flo™	0.360	28.7	Kick-Flo®	0.653	25.4	Mean Flow over Head Range	-	23.6	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	7.7	1.200	34.0	3.000	52.8	7.000	79.7	0.200	23.6	1.400	36.6	3.500	56.9	7.500	82.5	0.300	28.5	1.600	39.0	4.000	60.7	8.000	85.1	0.400	28.6	1.800	41.3	4.500	64.3	8.500	87.7	0.500	28.0	2.000	43.4	5.000	67.7	9.000	90.1	0.600	26.7	2.200	45.5	5.500	70.9	9.500	92.1	0.800	28.0	2.400	47.4	6.000	74.0			1.000	31.1	2.600	49.3	6.500	76.9		
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<u>Cascade Summary of Results for Basin I.srcx</u> <table><thead><tr><th colspan="2">Upstream Structures</th><th colspan="2">Outflow To</th><th colspan="2">Overflow To</th></tr><tr><th colspan="2">Basin J.srcx</th><th colspan="2">(None)</th><th colspan="2">(None)</th></tr><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Control (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>20.792</td><td>0.292</td><td>28.4</td><td>293.8</td><td>O K</td></tr><tr><td>30 min Summer</td><td>20.959</td><td>0.459</td><td>28.7</td><td>484.2</td><td>O K</td></tr><tr><td>60 min Summer</td><td>21.137</td><td>0.637</td><td>28.7</td><td>707.3</td><td>O K</td></tr><tr><td>120 min Summer</td><td>21.204</td><td>0.704</td><td>28.7</td><td>797.1</td><td>O K</td></tr><tr><td>180 min Summer</td><td>21.227</td><td>0.727</td><td>28.7</td><td>827.9</td><td>O K</td></tr><tr><td>240 min Summer</td><td>21.236</td><td>0.736</td><td>28.7</td><td>841.4</td><td>O K</td></tr><tr><td>360 min Summer</td><td>21.245</td><td>0.745</td><td>28.7</td><td>853.6</td><td>O K</td></tr><tr><td>480 min Summer</td><td>21.247</td><td>0.747</td><td>28.7</td><td>855.8</td><td>O K</td></tr><tr><td>600 min Summer</td><td>21.243</td><td>0.743</td><td>28.7</td><td>850.9</td><td>O K</td></tr><tr><td>720 min Summer</td><td>21.224</td><td>0.724</td><td>28.7</td><td>824.0</td><td>O K</td></tr><tr><td>960 min Summer</td><td>21.177</td><td>0.677</td><td>28.7</td><td>760.9</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>21.139</td><td>0.639</td><td>28.7</td><td>710.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>21.057</td><td>0.557</td><td>28.7</td><td>605.1</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>20.963</td><td>0.463</td><td>28.7</td><td>489.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>20.828</td><td>0.328</td><td>28.6</td><td>333.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>20.754</td><td>0.254</td><td>28.0</td><td>251.9</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>20.722</td><td>0.222</td><td>26.5</td><td>218.1</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>20.706</td><td>0.206</td><td>24.4</td><td>201.5</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>134.447</td><td>0.0</td><td>589.9</td><td>152</td></tr><tr><td>30 min Summer</td><td>90.183</td><td>0.0</td><td>795.3</td><td>168</td></tr><tr><td>60 min Summer</td><td>57.866</td><td>0.0</td><td>1034.4</td><td>196</td></tr><tr><td>120 min Summer</td><td>32.885</td><td>0.0</td><td>1176.4</td><td>250</td></tr><tr><td>180 min Summer</td><td>23.621</td><td>0.0</td><td>1267.8</td><td>302</td></tr><tr><td>240 min Summer</td><td>18.682</td><td>0.0</td><td>1337.2</td><td>354</td></tr><tr><td>360 min 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Summer	20.706	0.206	24.4	201.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	134.447	0.0	589.9	152	30 min Summer	90.183	0.0	795.3	168	60 min Summer	57.866	0.0	1034.4	196	120 min Summer	32.885	0.0	1176.4	250	180 min Summer	23.621	0.0	1267.8	302	240 min Summer	18.682	0.0	1337.2	354	360 min Summer	13.435	0.0	1442.7	444	480 min Summer	10.653	0.0	1525.5	526	600 min Summer	8.910	0.0	1594.8	608	720 min Summer	7.706	0.0	1655.2	686	960 min Summer	6.140	0.0	1758.0	818	1440 min Summer	4.483	0.0	1924.1	1008	2160 min Summer	3.294	0.0	2130.1	1324	2880 min Summer	2.663	0.0	2296.0	1676	4320 min Summer	2.002	0.0	2583.9	2360	5760 min Summer	1.655	0.0	2857.4	3024	7200 min Summer	1.442	0.0	3111.6	3704	8640 min Summer	1.297	0.0	3358.5	4416
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Summer</td><td>21.760</td><td>0.260</td><td>29.2</td><td>0.0</td><td>29.2</td><td>82.0</td><td>O K</td></tr><tr><td>360 min Summer</td><td>21.733</td><td>0.233</td><td>28.6</td><td>0.0</td><td>28.6</td><td>72.7</td><td>O K</td></tr><tr><td>480 min Summer</td><td>21.715</td><td>0.215</td><td>26.2</td><td>0.0</td><td>26.2</td><td>66.3</td><td>O K</td></tr><tr><td>600 min Summer</td><td>21.700</td><td>0.200</td><td>24.1</td><td>0.0</td><td>24.1</td><td>61.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>21.688</td><td>0.188</td><td>22.2</td><td>0.0</td><td>22.2</td><td>57.5</td><td>O K</td></tr><tr><td>960 min Summer</td><td>21.671</td><td>0.171</td><td>19.4</td><td>0.0</td><td>19.4</td><td>51.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>21.648</td><td>0.148</td><td>15.5</td><td>0.0</td><td>15.5</td><td>44.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>21.628</td><td>0.128</td><td>12.1</td><td>0.0</td><td>12.1</td><td>38.1</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>21.616</td><td>0.116</td><td>10.2</td><td>0.0</td><td>10.2</td><td>34.2</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>21.600</td><td>0.100</td><td>7.8</td><td>0.0</td><td>7.8</td><td>29.3</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>21.590</td><td>0.090</td><td>6.5</td><td>0.0</td><td>6.5</td><td>26.3</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>21.583</td><td>0.083</td><td>5.6</td><td>0.0</td><td>5.6</td><td>24.1</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>21.578</td><td>0.078</td><td>4.9</td><td>0.0</td><td>4.9</td><td>22.5</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Overflow Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>29.494</td><td>0.0</td><td>75.8</td><td>0.0</td><td>25</td></tr><tr><td>30 min Summer</td><td>19.618</td><td>0.0</td><td>101.2</td><td>0.0</td><td>33</td></tr><tr><td>60 min Summer</td><td>12.728</td><td>0.0</td><td>132.2</td><td>0.0</td><td>50</td></tr><tr><td>120 min Summer</td><td>8.110</td><td>0.0</td><td>168.6</td><td>0.0</td><td>84</td></tr><tr><td>180 min Summer</td><td>6.206</td><td>0.0</td><td>193.5</td><td>0.0</td><td>116</td></tr><tr><td>240 min Summer</td><td>5.126</td><td>0.0</td><td>213.2</td><td>0.0</td><td>148</td></tr><tr><td>360 min Summer</td><td>3.877</td><td>0.0</td><td>241.9</td><td>0.0</td><td>208</td></tr><tr><td>480 min Summer</td><td>3.179</td><td>0.0</td><td>264.5</td><td>0.0</td><td>268</td></tr><tr><td>600 min Summer</td><td>2.725</td><td>0.0</td><td>283.5</td><td>0.0</td><td>328</td></tr><tr><td>720 min Summer</td><td>2.403</td><td>0.0</td><td>300.0</td><td>0.0</td><td>388</td></tr><tr><td>960 min Summer</td><td>1.972</td><td>0.0</td><td>328.1</td><td>0.0</td><td>510</td></tr><tr><td>1440 min Summer</td><td>1.492</td><td>0.0</td><td>372.5</td><td>0.0</td><td>750</td></tr><tr><td>2160 min Summer</td><td>1.128</td><td>0.0</td><td>422.8</td><td>0.0</td><td>1112</td></tr><tr><td>2880 min Summer</td><td>0.925</td><td>0.0</td><td>462.2</td><td>0.0</td><td>1476</td></tr><tr><td>4320 min Summer</td><td>0.700</td><td>0.0</td><td>524.4</td><td>0.0</td><td>2208</td></tr><tr><td>5760 min Summer</td><td>0.575</td><td>0.0</td><td>575.1</td><td>0.0</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>0.492</td><td>0.0</td><td>615.7</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>0.433</td><td>0.0</td><td>649.9</td><td>0.0</td><td>4400</td></tr></tbody></table>				Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status	15 min Summer	21.699	0.199	23.9	0.0	23.9	61.1	O K	30 min Summer	21.740	0.240	28.9	0.0	28.9	74.8	O K	60 min Summer	21.768	0.268	29.3	0.0	29.3	84.5	O K	120 min Summer	21.779	0.279	29.5	0.0	29.5	88.7	O K	180 min Summer	21.773	0.273	29.4	0.0	29.4	86.3	O K	240 min Summer	21.760	0.260	29.2	0.0	29.2	82.0	O K	360 min Summer	21.733	0.233	28.6	0.0	28.6	72.7	O K	480 min Summer	21.715	0.215	26.2	0.0	26.2	66.3	O K	600 min Summer	21.700	0.200	24.1	0.0	24.1	61.4	O K	720 min Summer	21.688	0.188	22.2	0.0	22.2	57.5	O K	960 min Summer	21.671	0.171	19.4	0.0	19.4	51.8	O K	1440 min Summer	21.648	0.148	15.5	0.0	15.5	44.5	O K	2160 min Summer	21.628	0.128	12.1	0.0	12.1	38.1	O K	2880 min Summer	21.616	0.116	10.2	0.0	10.2	34.2	O K	4320 min Summer	21.600	0.100	7.8	0.0	7.8	29.3	O K	5760 min Summer	21.590	0.090	6.5	0.0	6.5	26.3	O K	7200 min Summer	21.583	0.083	5.6	0.0	5.6	24.1	O K	8640 min Summer	21.578	0.078	4.9	0.0	4.9	22.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)	15 min Summer	29.494	0.0	75.8	0.0	25	30 min Summer	19.618	0.0	101.2	0.0	33	60 min Summer	12.728	0.0	132.2	0.0	50	120 min Summer	8.110	0.0	168.6	0.0	84	180 min Summer	6.206	0.0	193.5	0.0	116	240 min Summer	5.126	0.0	213.2	0.0	148	360 min Summer	3.877	0.0	241.9	0.0	208	480 min Summer	3.179	0.0	264.5	0.0	268	600 min Summer	2.725	0.0	283.5	0.0	328	720 min Summer	2.403	0.0	300.0	0.0	388	960 min Summer	1.972	0.0	328.1	0.0	510	1440 min Summer	1.492	0.0	372.5	0.0	750	2160 min Summer	1.128	0.0	422.8	0.0	1112	2880 min Summer	0.925	0.0	462.2	0.0	1476	4320 min Summer	0.700	0.0	524.4	0.0	2208	5760 min Summer	0.575	0.0	575.1	0.0	2936	7200 min Summer	0.492	0.0	615.7	0.0	3672	8640 min Summer	0.433	0.0	649.9	0.0	4400
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Winter</td><td>21.752</td><td>0.252</td><td>29.1</td><td>0.0</td><td>29.1</td><td>79.1</td><td>O K</td></tr><tr><td>360 min Winter</td><td>21.717</td><td>0.217</td><td>26.5</td><td>0.0</td><td>26.5</td><td>67.1</td><td>O K</td></tr><tr><td>480 min Winter</td><td>21.694</td><td>0.194</td><td>23.2</td><td>0.0</td><td>23.2</td><td>59.5</td><td>O K</td></tr><tr><td>600 min Winter</td><td>21.678</td><td>0.178</td><td>20.5</td><td>0.0</td><td>20.5</td><td>54.2</td><td>O K</td></tr><tr><td>720 min Winter</td><td>21.666</td><td>0.166</td><td>18.5</td><td>0.0</td><td>18.5</td><td>50.2</td><td>O K</td></tr><tr><td>960 min Winter</td><td>21.649</td><td>0.149</td><td>15.5</td><td>0.0</td><td>15.5</td><td>44.5</td><td>O K</td></tr><tr><td>1440 min Winter</td><td>21.627</td><td>0.127</td><td>12.0</td><td>0.0</td><td>12.0</td><td>37.7</td><td>O K</td></tr><tr><td>2160 min Winter</td><td>21.609</td><td>0.109</td><td>9.2</td><td>0.0</td><td>9.2</td><td>32.1</td><td>O K</td></tr><tr><td>2880 min Winter</td><td>21.598</td><td>0.098</td><td>7.5</td><td>0.0</td><td>7.5</td><td>28.6</td><td>O K</td></tr><tr><td>4320 min Winter</td><td>21.584</td><td>0.084</td><td>5.7</td><td>0.0</td><td>5.7</td><td>24.5</td><td>O K</td></tr><tr><td>5760 min Winter</td><td>21.576</td><td>0.076</td><td>4.7</td><td>0.0</td><td>4.7</td><td>22.0</td><td>O K</td></tr><tr><td>7200 min Winter</td><td>21.570</td><td>0.070</td><td>4.0</td><td>0.0</td><td>4.0</td><td>20.2</td><td>O K</td></tr><tr><td>8640 min Winter</td><td>21.565</td><td>0.065</td><td>3.6</td><td>0.0</td><td>3.6</td><td>18.8</td><td>O K</td></tr><tr><td>10080 min Winter</td><td>21.562</td><td>0.062</td><td>3.2</td><td>0.0</td><td>3.2</td><td>17.7</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Overflow Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>10080 min Summer</td><td>0.389</td><td>0.0</td><td>680.2</td><td>0.0</td><td>5080</td></tr><tr><td>15 min Winter</td><td>29.494</td><td>0.0</td><td>85.1</td><td>0.0</td><td>25</td></tr><tr><td>30 min Winter</td><td>19.618</td><td>0.0</td><td>113.5</td><td>0.0</td><td>35</td></tr><tr><td>60 min Winter</td><td>12.728</td><td>0.0</td><td>148.1</td><td>0.0</td><td>54</td></tr><tr><td>120 min Winter</td><td>8.110</td><td>0.0</td><td>188.9</td><td>0.0</td><td>90</td></tr><tr><td>180 min Winter</td><td>6.206</td><td>0.0</td><td>216.8</td><td>0.0</td><td>122</td></tr><tr><td>240 min Winter</td><td>5.126</td><td>0.0</td><td>238.9</td><td>0.0</td><td>154</td></tr><tr><td>360 min Winter</td><td>3.877</td><td>0.0</td><td>271.0</td><td>0.0</td><td>214</td></tr><tr><td>480 min Winter</td><td>3.179</td><td>0.0</td><td>296.3</td><td>0.0</td><td>274</td></tr><tr><td>600 min Winter</td><td>2.725</td><td>0.0</td><td>317.6</td><td>0.0</td><td>334</td></tr><tr><td>720 min Winter</td><td>2.403</td><td>0.0</td><td>336.1</td><td>0.0</td><td>394</td></tr><tr><td>960 min Winter</td><td>1.972</td><td>0.0</td><td>367.6</td><td>0.0</td><td>514</td></tr><tr><td>1440 min Winter</td><td>1.492</td><td>0.0</td><td>417.3</td><td>0.0</td><td>756</td></tr><tr><td>2160 min Winter</td><td>1.128</td><td>0.0</td><td>473.6</td><td>0.0</td><td>1124</td></tr><tr><td>2880 min Winter</td><td>0.925</td><td>0.0</td><td>517.8</td><td>0.0</td><td>1480</td></tr><tr><td>4320 min Winter</td><td>0.700</td><td>0.0</td><td>587.5</td><td>0.0</td><td>2204</td></tr><tr><td>5760 min Winter</td><td>0.575</td><td>0.0</td><td>644.1</td><td>0.0</td><td>2944</td></tr><tr><td>7200 min Winter</td><td>0.492</td><td>0.0</td><td>689.7</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Winter</td><td>0.433</td><td>0.0</td><td>728.0</td><td>0.0</td><td>4400</td></tr><tr><td>10080 min Winter</td><td>0.389</td><td>0.0</td><td>761.9</td><td>0.0</td><td>5096</td></tr></table>				Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status	10080 min Summer	21.573	0.073	4.4	0.0	4.4	21.1	O K	15 min Winter	21.719	0.219	26.8	0.0	26.8	67.8	O K	30 min Winter	21.765	0.265	29.3	0.0	29.3	83.6	O K	60 min Winter	21.794	0.294	29.6	0.0	29.6	94.1	O K	120 min Winter	21.795	0.295	29.6	0.0	29.6	94.3	O K	180 min Winter	21.775	0.275	29.4	0.0	29.4	87.3	O K	240 min Winter	21.752	0.252	29.1	0.0	29.1	79.1	O K	360 min Winter	21.717	0.217	26.5	0.0	26.5	67.1	O K	480 min Winter	21.694	0.194	23.2	0.0	23.2	59.5	O K	600 min Winter	21.678	0.178	20.5	0.0	20.5	54.2	O K	720 min Winter	21.666	0.166	18.5	0.0	18.5	50.2	O K	960 min Winter	21.649	0.149	15.5	0.0	15.5	44.5	O K	1440 min Winter	21.627	0.127	12.0	0.0	12.0	37.7	O K	2160 min Winter	21.609	0.109	9.2	0.0	9.2	32.1	O K	2880 min Winter	21.598	0.098	7.5	0.0	7.5	28.6	O K	4320 min Winter	21.584	0.084	5.7	0.0	5.7	24.5	O K	5760 min Winter	21.576	0.076	4.7	0.0	4.7	22.0	O K	7200 min Winter	21.570	0.070	4.0	0.0	4.0	20.2	O K	8640 min Winter	21.565	0.065	3.6	0.0	3.6	18.8	O K	10080 min Winter	21.562	0.062	3.2	0.0	3.2	17.7	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)	10080 min Summer	0.389	0.0	680.2	0.0	5080	15 min Winter	29.494	0.0	85.1	0.0	25	30 min Winter	19.618	0.0	113.5	0.0	35	60 min Winter	12.728	0.0	148.1	0.0	54	120 min Winter	8.110	0.0	188.9	0.0	90	180 min Winter	6.206	0.0	216.8	0.0	122	240 min Winter	5.126	0.0	238.9	0.0	154	360 min Winter	3.877	0.0	271.0	0.0	214	480 min Winter	3.179	0.0	296.3	0.0	274	600 min Winter	2.725	0.0	317.6	0.0	334	720 min Winter	2.403	0.0	336.1	0.0	394	960 min Winter	1.972	0.0	367.6	0.0	514	1440 min Winter	1.492	0.0	417.3	0.0	756	2160 min Winter	1.128	0.0	473.6	0.0	1124	2880 min Winter	0.925	0.0	517.8	0.0	1480	4320 min Winter	0.700	0.0	587.5	0.0	2204	5760 min Winter	0.575	0.0	644.1	0.0	2944	7200 min Winter	0.492	0.0	689.7	0.0	3672	8640 min Winter	0.433	0.0	728.0	0.0	4400	10080 min Winter	0.389	0.0	761.9	0.0	5096
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PFA Consulting		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature J 1 year	
Date 03/11/2020 14:59 File Basin I and J.CASX	Designed by DAB Checked by MWS	
Causeway	Source Control 2019.1	

Cascade Rainfall Details for Basin J.srcx

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.390

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.348	4 8 0.348	8 12 0.347	12 16 0.347				

PFA Consulting		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature J 1 year	
Date 03/11/2020 14:59 File Basin I and J.CASX	Designed by DAB Checked by MWS	
Causeway		Source Control 2019.1

Cascade Model Details for Basin J.srcx

Storage is Online Cover Level (m) 22.743

Tank or Pond Structure

Invert Level (m) 21.500

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	280.0	0.401	392.7	0.801	521.5	1.201	666.4
0.101	306.7	0.501	423.4	0.901	556.3	1.243	682.5
0.201	334.4	0.601	455.1	1.001	592.0		
0.301	363.1	0.701	487.8	1.101	628.7		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0238-3000-0900-3000
Design Head (m)	0.900
Design Flow (l/s)	30.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	238
Invert Level (m)	21.500
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	30.0
Flush-Flo™	0.372	29.9
Kick-Flo®	0.690	26.4
Mean Flow over Head Range	-	24.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.8	1.200	34.4	3.000	53.5	7.000	80.8
0.200	24.0	1.400	37.0	3.500	57.7	7.500	83.5
0.300	29.7	1.600	39.5	4.000	61.5	8.000	86.2
0.400	29.9	1.800	41.8	4.500	65.1	8.500	88.8
0.500	29.4	2.000	44.0	5.000	68.6	9.000	91.3
0.600	28.4	2.200	46.1	5.500	71.8	9.500	93.2
0.800	28.3	2.400	48.0	6.000	74.9		
1.000	31.5	2.600	49.9	6.500	77.9		

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PFA Consulting		Page 1																																																																																																																																																																																																																																																																											
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Cascade Summary of Results for Basin J.srcx Upstream Structures Outflow To Basin I.srcx Overflow To Basin I.srcx <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Control (l/s)</th><th>Max Overflow (l/s)</th><th>Max Σ Outflow (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>22.273</td><td>0.773</td><td>29.9</td><td>60.2</td><td>88.0</td><td>302.1</td><td>O K</td></tr><tr><td>30 min Summer</td><td>22.352</td><td>0.852</td><td>29.9</td><td>181.3</td><td>210.5</td><td>343.5</td><td>O K</td></tr><tr><td>60 min Summer</td><td>22.375</td><td>0.875</td><td>29.9</td><td>225.0</td><td>254.6</td><td>356.2</td><td>O K</td></tr><tr><td>120 min Summer</td><td>22.348</td><td>0.848</td><td>29.9</td><td>175.1</td><td>204.2</td><td>341.7</td><td>O K</td></tr><tr><td>180 min Summer</td><td>22.326</td><td>0.826</td><td>29.9</td><td>137.6</td><td>166.3</td><td>330.1</td><td>O K</td></tr><tr><td>240 min Summer</td><td>22.309</td><td>0.809</td><td>29.9</td><td>110.7</td><td>139.2</td><td>321.0</td><td>O K</td></tr><tr><td>360 min Summer</td><td>22.284</td><td>0.784</td><td>29.9</td><td>75.0</td><td>103.1</td><td>308.1</td><td>O K</td></tr><tr><td>480 min Summer</td><td>22.267</td><td>0.767</td><td>29.9</td><td>52.9</td><td>80.7</td><td>299.1</td><td>O K</td></tr><tr><td>600 min Summer</td><td>22.254</td><td>0.754</td><td>29.9</td><td>38.2</td><td>65.8</td><td>292.2</td><td>O K</td></tr><tr><td>720 min Summer</td><td>22.242</td><td>0.742</td><td>29.9</td><td>26.2</td><td>53.5</td><td>286.5</td><td>O K</td></tr><tr><td>960 min Summer</td><td>22.219</td><td>0.719</td><td>29.9</td><td>7.9</td><td>34.8</td><td>274.9</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>22.031</td><td>0.531</td><td>29.9</td><td>0.0</td><td>29.9</td><td>187.9</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>21.826</td><td>0.326</td><td>29.8</td><td>0.0</td><td>29.8</td><td>105.7</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>21.736</td><td>0.236</td><td>28.8</td><td>0.0</td><td>28.8</td><td>73.5</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>21.690</td><td>0.190</td><td>22.5</td><td>0.0</td><td>22.5</td><td>58.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>21.667</td><td>0.167</td><td>18.7</td><td>0.0</td><td>18.7</td><td>50.6</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>21.654</td><td>0.154</td><td>16.4</td><td>0.0</td><td>16.4</td><td>46.1</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>21.644</td><td>0.144</td><td>14.7</td><td>0.0</td><td>14.7</td><td>43.0</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Overflow Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>134.447</td><td>0.0</td><td>349.3</td><td>31.0</td><td>25</td></tr><tr><td>30 min Summer</td><td>90.183</td><td>0.0</td><td>468.9</td><td>132.1</td><td>32</td></tr><tr><td>60 min Summer</td><td>57.866</td><td>0.0</td><td>602.7</td><td>231.6</td><td>46</td></tr><tr><td>120 min Summer</td><td>32.885</td><td>0.0</td><td>685.1</td><td>244.2</td><td>78</td></tr><tr><td>180 min Summer</td><td>23.621</td><td>0.0</td><td>738.2</td><td>228.2</td><td>108</td></tr><tr><td>240 min Summer</td><td>18.682</td><td>0.0</td><td>778.5</td><td>206.9</td><td>140</td></tr><tr><td>360 min Summer</td><td>13.435</td><td>0.0</td><td>839.8</td><td>168.2</td><td>206</td></tr><tr><td>480 min Summer</td><td>10.653</td><td>0.0</td><td>887.8</td><td>133.9</td><td>272</td></tr><tr><td>600 min Summer</td><td>8.910</td><td>0.0</td><td>928.2</td><td>102.4</td><td>340</td></tr><tr><td>720 min Summer</td><td>7.706</td><td>0.0</td><td>963.4</td><td>72.7</td><td>412</td></tr><tr><td>960 min Summer</td><td>6.140</td><td>0.0</td><td>1023.3</td><td>17.9</td><td>566</td></tr><tr><td>1440 min Summer</td><td>4.483</td><td>0.0</td><td>1120.6</td><td>0.0</td><td>824</td></tr><tr><td>2160 min Summer</td><td>3.294</td><td>0.0</td><td>1235.7</td><td>0.0</td><td>1152</td></tr><tr><td>2880 min Summer</td><td>2.663</td><td>0.0</td><td>1332.3</td><td>0.0</td><td>1476</td></tr><tr><td>4320 min Summer</td><td>2.002</td><td>0.0</td><td>1501.6</td><td>0.0</td><td>2204</td></tr><tr><td>5760 min Summer</td><td>1.655</td><td>0.0</td><td>1655.8</td><td>0.0</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.442</td><td>0.0</td><td>1803.4</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.297</td><td>0.0</td><td>1947.3</td><td>0.0</td><td>4400</td></tr></tbody></table>				Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status	15 min Summer	22.273	0.773	29.9	60.2	88.0	302.1	O K	30 min Summer	22.352	0.852	29.9	181.3	210.5	343.5	O K	60 min Summer	22.375	0.875	29.9	225.0	254.6	356.2	O K	120 min Summer	22.348	0.848	29.9	175.1	204.2	341.7	O K	180 min Summer	22.326	0.826	29.9	137.6	166.3	330.1	O K	240 min Summer	22.309	0.809	29.9	110.7	139.2	321.0	O K	360 min Summer	22.284	0.784	29.9	75.0	103.1	308.1	O K	480 min Summer	22.267	0.767	29.9	52.9	80.7	299.1	O K	600 min Summer	22.254	0.754	29.9	38.2	65.8	292.2	O K	720 min Summer	22.242	0.742	29.9	26.2	53.5	286.5	O K	960 min Summer	22.219	0.719	29.9	7.9	34.8	274.9	O K	1440 min Summer	22.031	0.531	29.9	0.0	29.9	187.9	O K	2160 min Summer	21.826	0.326	29.8	0.0	29.8	105.7	O K	2880 min Summer	21.736	0.236	28.8	0.0	28.8	73.5	O K	4320 min Summer	21.690	0.190	22.5	0.0	22.5	58.0	O K	5760 min Summer	21.667	0.167	18.7	0.0	18.7	50.6	O K	7200 min Summer	21.654	0.154	16.4	0.0	16.4	46.1	O K	8640 min Summer	21.644	0.144	14.7	0.0	14.7	43.0	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)	15 min Summer	134.447	0.0	349.3	31.0	25	30 min Summer	90.183	0.0	468.9	132.1	32	60 min Summer	57.866	0.0	602.7	231.6	46	120 min Summer	32.885	0.0	685.1	244.2	78	180 min Summer	23.621	0.0	738.2	228.2	108	240 min Summer	18.682	0.0	778.5	206.9	140	360 min Summer	13.435	0.0	839.8	168.2	206	480 min Summer	10.653	0.0	887.8	133.9	272	600 min Summer	8.910	0.0	928.2	102.4	340	720 min Summer	7.706	0.0	963.4	72.7	412	960 min Summer	6.140	0.0	1023.3	17.9	566	1440 min Summer	4.483	0.0	1120.6	0.0	824	2160 min Summer	3.294	0.0	1235.7	0.0	1152	2880 min Summer	2.663	0.0	1332.3	0.0	1476	4320 min Summer	2.002	0.0	1501.6	0.0	2204	5760 min Summer	1.655	0.0	1655.8	0.0	2936	7200 min Summer	1.442	0.0	1803.4	0.0	3672	8640 min Summer	1.297	0.0	1947.3	0.0	4400
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PFA Consulting								Page 2
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Wanborough Road		Strategic SuDS Feature J						
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Date 03/11/2020 14:28		Designed by DAB						
File Basin I and J.CASX		Checked by MWS						
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<u>Cascade Summary of Results for Basin J.srcx</u>								
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status	
10080 min Summer	21.637	0.137	13.5	0.0	13.5	40.8	O K	
15 min Winter	22.315	0.815	29.9	120.0	148.6	324.0	O K	
30 min Winter	22.381	0.881	29.9	236.7	266.3	359.5	O K	
60 min Winter	22.392	0.892	29.9	258.5	288.4	365.8	O K	
120 min Winter	22.352	0.852	29.9	182.2	211.4	343.9	O K	
180 min Winter	22.325	0.825	29.9	135.9	164.7	329.2	O K	
240 min Winter	22.306	0.806	29.9	105.5	133.9	319.2	O K	
360 min Winter	22.280	0.780	29.9	69.7	97.7	305.9	O K	
480 min Winter	22.263	0.763	29.9	48.8	76.5	297.1	O K	
600 min Winter	22.250	0.750	29.9	34.5	62.0	290.5	O K	
720 min Winter	22.239	0.739	29.9	23.4	50.7	284.7	O K	
960 min Winter	22.206	0.706	29.9	1.3	29.9	268.4	O K	
1440 min Winter	21.886	0.386	29.9	0.0	29.9	128.4	O K	
2160 min Winter	21.718	0.218	26.6	0.0	26.6	67.4	O K	
2880 min Winter	21.685	0.185	21.7	0.0	21.7	56.4	O K	
4320 min Winter	21.654	0.154	16.4	0.0	16.4	46.2	O K	
5760 min Winter	21.637	0.137	13.6	0.0	13.6	40.8	O K	
7200 min Winter	21.626	0.126	11.8	0.0	11.8	37.4	O K	
8640 min Winter	21.619	0.119	10.6	0.0	10.6	35.2	O K	
10080 min Winter	21.613	0.113	9.8	0.0	9.8	33.4	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
10080 min Summer	1.193	0.0	2089.3	0.0	5136			
15 min Winter	134.447	0.0	391.3	68.0	24			
30 min Winter	90.183	0.0	525.3	185.3	31			
60 min Winter	57.866	0.0	675.1	300.7	46			
120 min Winter	32.885	0.0	767.4	321.9	78			
180 min Winter	23.621	0.0	826.8	309.1	110			
240 min Winter	18.682	0.0	872.0	284.2	142			
360 min Winter	13.435	0.0	940.6	231.9	208			
480 min Winter	10.653	0.0	994.5	182.5	276			
600 min Winter	8.910	0.0	1039.7	134.7	348			
720 min Winter	7.706	0.0	1079.1	88.6	426			
960 min Winter	6.140	0.0	1146.2	1.9	626			
1440 min Winter	4.483	0.0	1255.1	0.0	838			
2160 min Winter	3.294	0.0	1384.0	0.0	1120			
2880 min Winter	2.663	0.0	1492.2	0.0	1476			
4320 min Winter	2.002	0.0	1682.0	0.0	2204			
5760 min Winter	1.655	0.0	1854.5	0.0	2936			
7200 min Winter	1.442	0.0	2019.9	0.0	3672			
8640 min Winter	1.297	0.0	2181.1	0.0	4408			
10080 min Winter	1.193	0.0	2340.2	0.0	5136			
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<u>Cascade Rainfall Details for Basin J.srcx</u> <table> <tr> <td>Rainfall Model</td> <td>FEH</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>FEH Rainfall Version</td> <td>2013</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>Site Location</td> <td>GB 448927 117350</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Data Type</td> <td>Point</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 1.390 <table> <thead> <tr> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> </tr> </thead> <tbody> <tr> <td>0 4</td> <td>0.348</td> <td>4 8</td> <td>0.348</td> <td>8 12</td> <td>0.347</td> <td>12 16</td> <td>0.347</td> </tr> </tbody> </table>			Rainfall Model	FEH	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	0.750	FEH Rainfall Version	2013	Cv (Winter)	0.840	Site Location	GB 448927 117350	Shortest Storm (mins)	15	Data Type	Point	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	0 4	0.348	4 8	0.348	8 12	0.347	12 16	0.347
Rainfall Model	FEH	Winter Storms	Yes																																															
Return Period (years)	100	Cv (Summer)	0.750																																															
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Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area																																											
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)																																											
0 4	0.348	4 8	0.348	8 12	0.347	12 16	0.347																																											
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PFA Consulting		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature J 100 year + 40%CC	
Date 03/11/2020 14:28 File Basin I and J.CASX	Designed by DAB Checked by MWS	
Causeway Source Control 2019.1		

Cascade Model Details for Basin J.srcx

Storage is Online Cover Level (m) 22.743

Tank or Pond Structure

Invert Level (m) 21.500

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	280.0	0.401	392.7	0.801	521.5	1.201	666.4
0.101	306.7	0.501	423.4	0.901	556.3	1.243	682.5
0.201	334.4	0.601	455.1	1.001	592.0		
0.301	363.1	0.701	487.8	1.101	628.7		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0238-3000-0900-3000
Design Head (m)	0.900
Design Flow (l/s)	30.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	238
Invert Level (m)	21.500
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	30.0
Flush-Flo™	0.372	29.9
Kick-Flo®	0.690	26.4
Mean Flow over Head Range	-	24.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.8	1.200	34.4	3.000	53.5	7.000	80.8
0.200	24.0	1.400	37.0	3.500	57.7	7.500	83.5
0.300	29.7	1.600	39.5	4.000	61.5	8.000	86.2
0.400	29.9	1.800	41.8	4.500	65.1	8.500	88.8
0.500	29.4	2.000	44.0	5.000	68.6	9.000	91.3
0.600	28.4	2.200	46.1	5.500	71.8	9.500	93.2
0.800	28.3	2.400	48.0	6.000	74.9		
1.000	31.5	2.600	49.9	6.500	77.9		

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PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature K 1 year			
Date 07/12/2020 15:18 File Basin K.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	19.371	0.071	3.4	59.1	O K
30 min Summer	19.391	0.091	5.2	76.3	O K
60 min Summer	19.410	0.110	7.1	92.9	O K
120 min Summer	19.424	0.124	8.5	105.5	O K
180 min Summer	19.432	0.132	9.4	112.3	O K
240 min Summer	19.436	0.136	9.8	116.5	O K
360 min Summer	19.440	0.140	10.2	119.6	O K
480 min Summer	19.440	0.140	10.2	119.9	O K
600 min Summer	19.439	0.139	10.1	118.9	O K
720 min Summer	19.437	0.137	9.9	117.3	O K
960 min Summer	19.433	0.133	9.5	113.3	O K
1440 min Summer	19.424	0.124	8.5	105.4	O K
2160 min Summer	19.413	0.113	7.4	95.6	O K
2880 min Summer	19.404	0.104	6.5	88.2	O K
4320 min Summer	19.393	0.093	5.4	77.9	O K
5760 min Summer	19.385	0.085	4.6	71.0	O K
7200 min Summer	19.379	0.079	4.0	65.8	O K
8640 min Summer	19.374	0.074	3.6	61.7	O K
10080 min Summer	19.370	0.070	3.3	58.5	O K
15 min Winter	19.379	0.079	4.1	66.0	O K
30 min Winter	19.401	0.101	6.2	85.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	52.0	22	
30 min Summer	19.618	0.0	71.6	36	
60 min Summer	12.728	0.0	100.2	62	
120 min Summer	8.110	0.0	128.9	100	
180 min Summer	6.206	0.0	148.6	130	
240 min Summer	5.126	0.0	164.1	164	
360 min Summer	3.877	0.0	186.7	232	
480 min Summer	3.179	0.0	204.5	298	
600 min Summer	2.725	0.0	219.3	364	
720 min Summer	2.403	0.0	232.2	430	
960 min Summer	1.972	0.0	254.0	556	
1440 min Summer	1.492	0.0	287.9	806	
2160 min Summer	1.128	0.0	331.9	1172	
2880 min Summer	0.925	0.0	362.6	1532	
4320 min Summer	0.700	0.0	409.4	2252	
5760 min Summer	0.575	0.0	453.9	3000	
7200 min Summer	0.492	0.0	485.6	3744	
8640 min Summer	0.433	0.0	511.7	4416	
10080 min Summer	0.389	0.0	533.7	5152	
15 min Winter	29.494	0.0	59.1	22	
30 min Winter	19.618	0.0	81.2	35	
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PFA Consulting Ltd				Page 2	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature K 1 year			
Date 07/12/2020 15:18 File Basin K.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	19.422	0.122	8.4	103.9	O K
120 min Winter	19.437	0.137	9.9	117.5	O K
180 min Winter	19.445	0.145	10.6	124.1	O K
240 min Winter	19.448	0.148	10.9	127.3	O K
360 min Winter	19.448	0.148	11.0	127.4	O K
480 min Winter	19.446	0.146	10.7	125.1	O K
600 min Winter	19.442	0.142	10.4	121.8	O K
720 min Winter	19.438	0.138	10.0	118.2	O K
960 min Winter	19.431	0.131	9.3	111.4	O K
1440 min Winter	19.418	0.118	7.9	100.0	O K
2160 min Winter	19.404	0.104	6.5	87.8	O K
2880 min Winter	19.394	0.094	5.5	79.4	O K
4320 min Winter	19.382	0.082	4.4	68.6	O K
5760 min Winter	19.374	0.074	3.6	61.7	O K
7200 min Winter	19.368	0.068	3.1	56.8	O K
8640 min Winter	19.364	0.064	2.8	53.0	O K
10080 min Winter	19.360	0.060	2.5	50.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	12.728	0.0	112.8	62	
120 min Winter	8.110	0.0	145.0	102	
180 min Winter	6.206	0.0	167.1	138	
240 min Winter	5.126	0.0	184.4	176	
360 min Winter	3.877	0.0	209.7	248	
480 min Winter	3.179	0.0	229.6	318	
600 min Winter	2.725	0.0	246.3	386	
720 min Winter	2.403	0.0	260.8	452	
960 min Winter	1.972	0.0	285.2	580	
1440 min Winter	1.492	0.0	323.3	834	
2160 min Winter	1.128	0.0	372.2	1208	
2880 min Winter	0.925	0.0	406.6	1564	
4320 min Winter	0.700	0.0	459.5	2292	
5760 min Winter	0.575	0.0	508.6	3000	
7200 min Winter	0.492	0.0	544.2	3752	
8640 min Winter	0.433	0.0	573.7	4496	
10080 min Winter	0.389	0.0	598.7	5240	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature K 1 year	
Date 07/12/2020 15:18 File Basin K.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.102

Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)
0	4	0.500	4	8	0.602

Time Area Diagram

Total Area (ha) 0.000

Time (mins) Area		
From:	To:	(ha)
0	4	0.000

Time Area Diagram

Total Area (ha) 0.000

Time (mins) Area		
From:	To:	(ha)
0	4	0.000

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature K 1 year	
Date 07/12/2020 15:18 File Basin K.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 20.200

Tank or Pond Structure

Invert Level (m) 19.300

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	806.9	0.201	954.3	0.501	1182.8	0.801	1420.4
0.001	806.9	0.301	1029.5	0.601	1261.0	0.900	1500.8
0.101	880.1	0.401	1105.6	0.701	1340.2		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0172-1350-0600-1350
Design Head (m)	0.600
Design Flow (l/s)	13.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	172
Invert Level (m)	19.300
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.600	13.5
Flush-Flo™	0.260	13.5
Kick-Flo®	0.469	12.0
Mean Flow over Head Range	-	10.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.1	1.200	18.7	3.000	29.1	7.000	43.6
0.200	13.3	1.400	20.2	3.500	31.3	7.500	45.2
0.300	13.4	1.600	21.5	4.000	33.4	8.000	46.7
0.400	12.9	1.800	22.8	4.500	35.4	8.500	48.1
0.500	12.4	2.000	23.9	5.000	37.2	9.000	49.6
0.600	13.5	2.200	25.1	5.500	39.0	9.500	50.9
0.800	15.5	2.400	26.1	6.000	40.7		
1.000	17.2	2.600	27.1	6.500	42.0		

PFA Consulting Ltd					Page 1
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature K 100yr + 40%CC			
Date 07/12/2020 15:20 File Basin K.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	19.593	0.293	13.5	267.5	O K
30 min Summer	19.676	0.376	13.5	354.8	O K
60 min Summer	19.757	0.457	13.5	445.4	O K
120 min Summer	19.787	0.487	13.5	480.4	O K
180 min Summer	19.796	0.496	13.5	491.4	O K
240 min Summer	19.797	0.497	13.5	491.9	O K
360 min Summer	19.788	0.488	13.5	481.4	O K
480 min Summer	19.778	0.478	13.5	470.4	O K
600 min Summer	19.768	0.468	13.5	458.7	O K
720 min Summer	19.757	0.457	13.5	446.0	O K
960 min Summer	19.734	0.434	13.5	419.8	O K
1440 min Summer	19.689	0.389	13.5	369.9	O K
2160 min Summer	19.628	0.328	13.5	304.4	O K
2880 min Summer	19.578	0.278	13.5	252.8	O K
4320 min Summer	19.511	0.211	13.4	186.0	O K
5760 min Summer	19.475	0.175	13.1	152.1	O K
7200 min Summer	19.459	0.159	11.8	137.2	O K
8640 min Summer	19.448	0.148	11.0	127.7	O K
10080 min Summer	19.441	0.141	10.3	120.8	O K
15 min Winter	19.625	0.325	13.5	300.6	O K
30 min Winter	19.716	0.416	13.5	399.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	266.3	22	
30 min Summer	90.183	0.0	359.9	37	
60 min Summer	57.866	0.0	472.3	66	
120 min Summer	32.885	0.0	537.4	124	
180 min Summer	23.621	0.0	579.2	182	
240 min Summer	18.682	0.0	611.0	242	
360 min Summer	13.435	0.0	659.3	314	
480 min Summer	10.653	0.0	697.1	376	
600 min Summer	8.910	0.0	728.9	438	
720 min Summer	7.706	0.0	756.5	502	
960 min Summer	6.140	0.0	803.5	636	
1440 min Summer	4.483	0.0	879.3	898	
2160 min Summer	3.294	0.0	976.2	1280	
2880 min Summer	2.663	0.0	1052.1	1644	
4320 min Summer	2.002	0.0	1183.1	2336	
5760 min Summer	1.655	0.0	1310.6	3000	
7200 min Summer	1.442	0.0	1427.0	3744	
8640 min Summer	1.297	0.0	1539.9	4416	
10080 min Summer	1.193	0.0	1649.6	5144	
15 min Winter	134.447	0.0	299.2	22	
30 min Winter	90.183	0.0	404.0	36	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature K 100yr + 40%CC			
Date 07/12/2020 15:20 File Basin K.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	19.805	0.505	13.5	501.9	O K
120 min Winter	19.839	0.539	13.5	543.1	O K
180 min Winter	19.851	0.551	13.5	557.4	O K
240 min Winter	19.854	0.554	13.5	560.3	O K
360 min Winter	19.845	0.545	13.5	550.3	O K
480 min Winter	19.831	0.531	13.5	533.2	O K
600 min Winter	19.819	0.519	13.5	518.4	O K
720 min Winter	19.805	0.505	13.5	502.0	O K
960 min Winter	19.774	0.474	13.5	465.2	O K
1440 min Winter	19.703	0.403	13.5	384.8	O K
2160 min Winter	19.607	0.307	13.5	282.2	O K
2880 min Winter	19.534	0.234	13.5	208.6	O K
4320 min Winter	19.465	0.165	12.3	142.9	O K
5760 min Winter	19.443	0.143	10.5	122.6	O K
7200 min Winter	19.430	0.130	9.2	111.1	O K
8640 min Winter	19.422	0.122	8.3	103.4	O K
10080 min Winter	19.416	0.116	7.7	98.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	529.5	66	
120 min Winter	32.885	0.0	602.4	122	
180 min Winter	23.621	0.0	649.3	180	
240 min Winter	18.682	0.0	684.9	236	
360 min Winter	13.435	0.0	738.9	342	
480 min Winter	10.653	0.0	781.3	394	
600 min Winter	8.910	0.0	816.8	466	
720 min Winter	7.706	0.0	847.8	544	
960 min Winter	6.140	0.0	900.4	698	
1440 min Winter	4.483	0.0	985.4	974	
2160 min Winter	3.294	0.0	1093.8	1348	
2880 min Winter	2.663	0.0	1178.9	1700	
4320 min Winter	2.002	0.0	1326.3	2296	
5760 min Winter	1.655	0.0	1468.2	3000	
7200 min Winter	1.442	0.0	1598.7	3744	
8640 min Winter	1.297	0.0	1725.3	4416	
10080 min Winter	1.193	0.0	1849.0	5144	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature K 100yr + 40%CC	
Date 07/12/2020 15:20 File Basin K.srcx	Designed by DAB Checked by MWS	
XP Solutions		
Source Control 2019.1		

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 448927 117350	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.102

Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)	
0 4 0.500		4 8 0.602	

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	
0 4 0.000	

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	
0 4 0.000	

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature K 100yr + 40%CC	
Date 07/12/2020 15:20 File Basin K.srcx	Designed by DAB Checked by MWS	
XP Solutions Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 20.200

Tank or Pond Structure

Invert Level (m) 19.300

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	806.9	0.201	954.3	0.501	1182.8	0.801	1420.4
0.001	806.9	0.301	1029.5	0.601	1261.0	0.900	1500.8
0.101	880.1	0.401	1105.6	0.701	1340.2		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0172-1350-0600-1350
Design Head (m)	0.600
Design Flow (l/s)	13.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	172
Invert Level (m)	19.300
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.600	13.5
Flush-Flo™	0.260	13.5
Kick-Flo®	0.469	12.0
Mean Flow over Head Range	-	10.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.1	1.200	18.7	3.000	29.1	7.000	43.6
0.200	13.3	1.400	20.2	3.500	31.3	7.500	45.2
0.300	13.4	1.600	21.5	4.000	33.4	8.000	46.7
0.400	12.9	1.800	22.8	4.500	35.4	8.500	48.1
0.500	12.4	2.000	23.9	5.000	37.2	9.000	49.6
0.600	13.5	2.200	25.1	5.500	39.0	9.500	50.9
0.800	15.5	2.400	26.1	6.000	40.7		
1.000	17.2	2.600	27.1	6.500	42.0		

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K</td></tr><tr><td>600 min Summer</td><td>19.212</td><td>0.212</td><td>29.9</td><td>405.3</td><td>O K</td></tr><tr><td>720 min Summer</td><td>19.211</td><td>0.211</td><td>29.7</td><td>401.8</td><td>O K</td></tr><tr><td>960 min Summer</td><td>19.206</td><td>0.206</td><td>28.7</td><td>391.3</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>19.194</td><td>0.194</td><td>26.2</td><td>367.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>19.178</td><td>0.178</td><td>23.0</td><td>336.0</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>19.166</td><td>0.166</td><td>20.6</td><td>311.3</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>19.148</td><td>0.148</td><td>17.0</td><td>276.3</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>19.136</td><td>0.136</td><td>14.7</td><td>252.5</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>19.126</td><td>0.126</td><td>12.9</td><td>234.4</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>19.119</td><td>0.119</td><td>11.6</td><td>219.7</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>19.113</td><td>0.113</td><td>10.6</td><td>208.4</td><td>O K</td></tr><tr><td>15 min Winter</td><td>19.115</td><td>0.115</td><td>11.0</td><td>213.6</td><td>O K</td></tr><tr><td>30 min Winter</td><td>19.148</td><td>0.148</td><td>17.0</td><td>276.6</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>29.494</td><td>0.0</td><td>163.5</td><td>29</td></tr><tr><td>30 min Summer</td><td>19.618</td><td>0.0</td><td>226.7</td><td>42</td></tr><tr><td>60 min Summer</td><td>12.728</td><td>0.0</td><td>322.0</td><td>66</td></tr><tr><td>120 min Summer</td><td>8.110</td><td>0.0</td><td>415.0</td><td>110</td></tr><tr><td>180 min Summer</td><td>6.206</td><td>0.0</td><td>478.8</td><td>140</td></tr><tr><td>240 min Summer</td><td>5.126</td><td>0.0</td><td>529.1</td><td>172</td></tr><tr><td>360 min Summer</td><td>3.877</td><td>0.0</td><td>602.2</td><td>240</td></tr><tr><td>480 min Summer</td><td>3.179</td><td>0.0</td><td>659.6</td><td>306</td></tr><tr><td>600 min Summer</td><td>2.725</td><td>0.0</td><td>707.6</td><td>374</td></tr><tr><td>720 min Summer</td><td>2.403</td><td>0.0</td><td>749.3</td><td>438</td></tr><tr><td>960 min Summer</td><td>1.972</td><td>0.0</td><td>819.8</td><td>566</td></tr><tr><td>1440 min Summer</td><td>1.492</td><td>0.0</td><td>928.7</td><td>816</td></tr><tr><td>2160 min Summer</td><td>1.128</td><td>0.0</td><td>1074.8</td><td>1188</td></tr><tr><td>2880 min Summer</td><td>0.925</td><td>0.0</td><td>1173.8</td><td>1556</td></tr><tr><td>4320 min Summer</td><td>0.700</td><td>0.0</td><td>1324.5</td><td>2292</td></tr><tr><td>5760 min Summer</td><td>0.575</td><td>0.0</td><td>1471.5</td><td>3000</td></tr><tr><td>7200 min 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Summer	19.194	0.194	26.2	367.7	O K	2160 min Summer	19.178	0.178	23.0	336.0	O K	2880 min Summer	19.166	0.166	20.6	311.3	O K	4320 min Summer	19.148	0.148	17.0	276.3	O K	5760 min Summer	19.136	0.136	14.7	252.5	O K	7200 min Summer	19.126	0.126	12.9	234.4	O K	8640 min Summer	19.119	0.119	11.6	219.7	O K	10080 min Summer	19.113	0.113	10.6	208.4	O K	15 min Winter	19.115	0.115	11.0	213.6	O K	30 min Winter	19.148	0.148	17.0	276.6	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	29.494	0.0	163.5	29	30 min Summer	19.618	0.0	226.7	42	60 min Summer	12.728	0.0	322.0	66	120 min Summer	8.110	0.0	415.0	110	180 min Summer	6.206	0.0	478.8	140	240 min Summer	5.126	0.0	529.1	172	360 min Summer	3.877	0.0	602.2	240	480 min Summer	3.179	0.0	659.6	306	600 min Summer	2.725	0.0	707.6	374	720 min Summer	2.403	0.0	749.3	438	960 min Summer	1.972	0.0	819.8	566	1440 min Summer	1.492	0.0	928.7	816	2160 min Summer	1.128	0.0	1074.8	1188	2880 min Summer	0.925	0.0	1173.8	1556	4320 min Summer	0.700	0.0	1324.5	2292	5760 min Summer	0.575	0.0	1471.5	3000	7200 min Summer	0.492	0.0	1573.9	3744	8640 min Summer	0.433	0.0	1658.3	4424	10080 min Summer	0.389	0.0	1728.3	5152	15 min Winter	29.494	0.0	186.4	29	30 min Winter	19.618	0.0	257.5	41
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PFA Consulting Ltd		Page 2
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature L 1 year	
Date 07/12/2020 17:11 File Basin L.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Winter	19.180	0.180	23.5	340.8	O K
120 min Winter	19.206	0.206	28.7	391.8	O K
180 min Winter	19.217	0.217	30.9	414.8	O K
240 min Winter	19.224	0.224	32.1	427.7	O K
360 min Winter	19.226	0.226	32.5	432.9	O K
480 min Winter	19.224	0.224	32.1	428.4	O K
600 min Winter	19.220	0.220	31.4	420.0	O K
720 min Winter	19.215	0.215	30.4	410.1	O K
960 min Winter	19.205	0.205	28.5	389.6	O K
1440 min Winter	19.187	0.187	24.8	353.1	O K
2160 min Winter	19.166	0.166	20.6	312.0	O K
2880 min Winter	19.151	0.151	17.7	283.1	O K
4320 min Winter	19.132	0.132	13.9	245.1	O K
5760 min Winter	19.119	0.119	11.7	220.8	O K
7200 min Winter	19.110	0.110	10.1	203.2	O K
8640 min Winter	19.103	0.103	8.9	189.6	O K
10080 min Winter	19.097	0.097	8.1	178.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	12.728	0.0	362.8	66
120 min Winter	8.110	0.0	467.0	114
180 min Winter	6.206	0.0	538.6	146
240 min Winter	5.126	0.0	594.9	182
360 min Winter	3.877	0.0	676.8	256
480 min Winter	3.179	0.0	741.2	326
600 min Winter	2.725	0.0	795.1	396
720 min Winter	2.403	0.0	841.9	462
960 min Winter	1.972	0.0	921.1	594
1440 min Winter	1.492	0.0	1043.7	848
2160 min Winter	1.128	0.0	1205.3	1220
2880 min Winter	0.925	0.0	1316.6	1588
4320 min Winter	0.700	0.0	1486.8	2332
5760 min Winter	0.575	0.0	1649.1	3056
7200 min Winter	0.492	0.0	1764.2	3760
8640 min Winter	0.433	0.0	1859.4	4504
10080 min Winter	0.389	0.0	1939.6	5240

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature L 1 year	
Date 07/12/2020 17:11 File Basin L.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 3.576

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.894	4 8	0.894	8 12	0.894	12 16	0.894

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature L 1 year	
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Model Details

Storage is Online Cover Level (m) 20.200

Tank or Pond Structure

Invert Level (m) 19.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1787.7	0.401	2247.7	0.801	2723.7	1.200	3214.5
0.101	1901.2	0.501	2365.2	0.901	2845.2		
0.201	2015.7	0.601	2483.7	1.001	2967.7		
0.301	2131.2	0.701	2603.2	1.101	3091.3		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0267-3950-0900-3950
Design Head (m)	0.900
Design Flow (l/s)	39.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	267
Invert Level (m)	19.000
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	39.5
Flush-Flo™	0.401	39.5
Kick-Flo®	0.706	35.2
Mean Flow over Head Range	-	31.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.5	1.200	45.4	3.000	70.6	7.000	106.7
0.200	27.5	1.400	48.9	3.500	76.1	7.500	110.4
0.300	38.8	1.600	52.1	4.000	81.3	8.000	113.9
0.400	39.5	1.800	55.2	4.500	86.0	8.500	117.4
0.500	39.0	2.000	58.0	5.000	90.6	9.000	120.7
0.600	37.8	2.200	60.8	5.500	94.9	9.500	123.1
0.800	37.3	2.400	63.4	6.000	99.0		
1.000	41.6	2.600	65.9	6.500	102.9		

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature L 100yr + 40%CC			
Date 07/12/2020 17:12 File Basin L.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
Summary of Results for 100 year Return Period (+40%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	19.424	0.424	39.5	860.4	O K
30 min Summer	19.546	0.546	39.5	1146.2	O K
60 min Summer	19.666	0.666	39.5	1446.5	O K
120 min Summer	19.715	0.715	39.5	1573.4	O K
180 min Summer	19.734	0.734	39.5	1621.8	O K
240 min Summer	19.739	0.739	39.5	1635.8	O K
360 min Summer	19.731	0.731	39.5	1615.1	O K
480 min Summer	19.720	0.720	39.5	1584.8	O K
600 min Summer	19.708	0.708	39.5	1552.9	O K
720 min Summer	19.694	0.694	39.5	1518.3	O K
960 min Summer	19.666	0.666	39.5	1445.6	O K
1440 min Summer	19.609	0.609	39.5	1301.1	O K
2160 min Summer	19.527	0.527	39.5	1102.0	O K
2880 min Summer	19.458	0.458	39.5	937.6	O K
4320 min Summer	19.355	0.355	39.3	707.3	O K
5760 min Summer	19.292	0.292	38.6	570.9	O K
7200 min Summer	19.258	0.258	37.7	498.3	O K
8640 min Summer	19.240	0.240	34.9	461.7	O K
10080 min Summer	19.228	0.228	32.8	436.9	O K
15 min Winter	19.470	0.470	39.5	967.3	O K
30 min Winter	19.605	0.605	39.5	1290.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	856.0	29	
30 min Summer	90.183	0.0	1158.4	43	
60 min Summer	57.866	0.0	1528.3	72	
120 min Summer	32.885	0.0	1739.0	130	
180 min Summer	23.621	0.0	1874.6	186	
240 min Summer	18.682	0.0	1977.6	244	
360 min Summer	13.435	0.0	2133.8	342	
480 min Summer	10.653	0.0	2256.3	396	
600 min Summer	8.910	0.0	2358.8	458	
720 min Summer	7.706	0.0	2448.1	520	
960 min Summer	6.140	0.0	2599.9	654	
1440 min Summer	4.483	0.0	2844.1	920	
2160 min Summer	3.294	0.0	3165.1	1308	
2880 min Summer	2.663	0.0	3410.9	1680	
4320 min Summer	2.002	0.0	3834.2	2384	
5760 min Summer	1.655	0.0	4251.3	3064	
7200 min Summer	1.442	0.0	4628.7	3744	
8640 min Summer	1.297	0.0	4994.2	4424	
10080 min Summer	1.193	0.0	5348.6	5152	
15 min Winter	134.447	0.0	962.5	29	
30 min Winter	90.183	0.0	1300.6	43	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature L 100yr + 40%CC			
Date 07/12/2020 17:12 File Basin L.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	19.738	0.738	39.5	1631.9	O K
120 min Winter	19.792	0.792	39.5	1778.8	O K
180 min Winter	19.814	0.814	39.5	1838.2	O K
240 min Winter	19.822	0.822	39.5	1859.9	O K
360 min Winter	19.818	0.818	39.5	1848.0	O K
480 min Winter	19.802	0.802	39.5	1803.7	O K
600 min Winter	19.785	0.785	39.5	1759.4	O K
720 min Winter	19.769	0.769	39.5	1715.8	O K
960 min Winter	19.732	0.732	39.5	1616.9	O K
1440 min Winter	19.643	0.643	39.5	1387.9	O K
2160 min Winter	19.514	0.514	39.5	1069.9	O K
2880 min Winter	19.407	0.407	39.5	821.6	O K
4320 min Winter	19.274	0.274	38.3	532.0	O K
5760 min Winter	19.233	0.233	33.7	446.5	O K
7200 min Winter	19.211	0.211	29.8	402.9	O K
8640 min Winter	19.197	0.197	26.9	374.6	O K
10080 min Winter	19.187	0.187	24.9	354.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	1713.6	72	
120 min Winter	32.885	0.0	1949.6	128	
180 min Winter	23.621	0.0	2101.5	184	
240 min Winter	18.682	0.0	2216.8	240	
360 min Winter	13.435	0.0	2391.8	350	
480 min Winter	10.653	0.0	2528.9	450	
600 min Winter	8.910	0.0	2643.7	482	
720 min Winter	7.706	0.0	2743.6	558	
960 min Winter	6.140	0.0	2913.3	714	
1440 min Winter	4.483	0.0	3187.1	1002	
2160 min Winter	3.294	0.0	3546.6	1392	
2880 min Winter	2.663	0.0	3822.5	1756	
4320 min Winter	2.002	0.0	4298.6	2380	
5760 min Winter	1.655	0.0	4762.7	3056	
7200 min Winter	1.442	0.0	5185.7	3752	
8640 min Winter	1.297	0.0	5596.1	4496	
10080 min Winter	1.193	0.0	5995.8	5152	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature L 100yr + 40%CC	
Date 07/12/2020 17:12 File Basin L.srcx	Designed by DAB Checked by MWS	
XP Solutions		
Source Control 2019.1		

Source Control 2019.1

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 448927 117350	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 3.576

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	
From:	To:	From:	To:	From:	To:	From:	To:	
0	4	0.894	4	8	0.894	8	12	0.894
						12	16	0.894

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature L 100yr + 40%CC	
Date 07/12/2020 17:12 File Basin L.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 20.200

Tank or Pond Structure

Invert Level (m) 19.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1787.7	0.401	2247.7	0.801	2723.7	1.200	3214.5
0.101	1901.2	0.501	2365.2	0.901	2845.2		
0.201	2015.7	0.601	2483.7	1.001	2967.7		
0.301	2131.2	0.701	2603.2	1.101	3091.3		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0267-3950-0900-3950
Design Head (m)	0.900
Design Flow (l/s)	39.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	267
Invert Level (m)	19.000
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	39.5
Flush-Flo™	0.401	39.5
Kick-Flo®	0.706	35.2
Mean Flow over Head Range	-	31.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.5	1.200	45.4	3.000	70.6	7.000	106.7
0.200	27.5	1.400	48.9	3.500	76.1	7.500	110.4
0.300	38.8	1.600	52.1	4.000	81.3	8.000	113.9
0.400	39.5	1.800	55.2	4.500	86.0	8.500	117.4
0.500	39.0	2.000	58.0	5.000	90.6	9.000	120.7
0.600	37.8	2.200	60.8	5.500	94.9	9.500	123.1
0.800	37.3	2.400	63.4	6.000	99.0		
1.000	41.6	2.600	65.9	6.500	102.9		

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature A 1 year			
Date 07/12/2020 15:44 File Basin M.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.392	0.092	5.7	75.4	O K
30 min Summer	18.417	0.117	8.6	96.6	O K
60 min Summer	18.441	0.141	11.5	116.8	O K
120 min Summer	18.458	0.158	13.5	131.9	O K
180 min Summer	18.467	0.167	14.4	139.7	O K
240 min Summer	18.472	0.172	14.9	143.9	O K
360 min Summer	18.474	0.174	15.1	145.8	O K
480 min Summer	18.473	0.173	14.9	144.5	O K
600 min Summer	18.470	0.170	14.7	141.9	O K
720 min Summer	18.466	0.166	14.3	138.7	O K
960 min Summer	18.459	0.159	13.5	132.2	O K
1440 min Summer	18.446	0.146	12.1	120.7	O K
2160 min Summer	18.431	0.131	10.3	107.9	O K
2880 min Summer	18.420	0.120	8.9	98.8	O K
4320 min Summer	18.406	0.106	7.3	86.6	O K
5760 min Summer	18.396	0.096	6.2	78.5	O K
7200 min Summer	18.389	0.089	5.4	72.7	O K
8640 min Summer	18.384	0.084	4.8	68.2	O K
10080 min Summer	18.379	0.079	4.4	64.5	O K
15 min Winter	18.403	0.103	6.9	84.2	O K
30 min Winter	18.431	0.131	10.3	107.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	70.9	28	
30 min Summer	19.618	0.0	96.8	40	
60 min Summer	12.728	0.0	132.6	64	
120 min Summer	8.110	0.0	170.2	98	
180 min Summer	6.206	0.0	195.9	130	
240 min Summer	5.126	0.0	216.2	164	
360 min Summer	3.877	0.0	245.7	232	
480 min Summer	3.179	0.0	268.9	298	
600 min Summer	2.725	0.0	288.4	362	
720 min Summer	2.403	0.0	305.3	426	
960 min Summer	1.972	0.0	334.0	550	
1440 min Summer	1.492	0.0	378.6	794	
2160 min Summer	1.128	0.0	434.4	1160	
2880 min Summer	0.925	0.0	474.7	1528	
4320 min Summer	0.700	0.0	536.7	2252	
5760 min Summer	0.575	0.0	593.1	2992	
7200 min Summer	0.492	0.0	634.6	3680	
8640 min Summer	0.433	0.0	669.1	4416	
10080 min Summer	0.389	0.0	698.4	5152	
15 min Winter	29.494	0.0	80.3	28	
30 min Winter	19.618	0.0	109.3	40	
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Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature A 1 year	
Date 07/12/2020 15:44 File Basin M.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Winter	18.457	0.157	13.3	130.4	O K
120 min Winter	18.475	0.175	15.2	146.6	O K
180 min Winter	18.483	0.183	15.9	153.4	O K
240 min Winter	18.486	0.186	16.2	155.8	O K
360 min Winter	18.483	0.183	15.9	153.4	O K
480 min Winter	18.477	0.177	15.4	148.4	O K
600 min Winter	18.471	0.171	14.8	142.8	O K
720 min Winter	18.465	0.165	14.2	137.2	O K
960 min Winter	18.453	0.153	12.9	127.3	O K
1440 min Winter	18.436	0.136	10.9	112.2	O K
2160 min Winter	18.418	0.118	8.7	97.3	O K
2880 min Winter	18.407	0.107	7.4	87.6	O K
4320 min Winter	18.392	0.092	5.7	75.3	O K
5760 min Winter	18.383	0.083	4.8	67.7	O K
7200 min Winter	18.377	0.077	4.1	62.2	O K
8640 min Winter	18.371	0.071	3.6	58.1	O K
10080 min Winter	18.368	0.068	3.3	54.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	12.728	0.0	149.1	64
120 min Winter	8.110	0.0	191.1	102
180 min Winter	6.206	0.0	220.0	138
240 min Winter	5.126	0.0	242.7	176
360 min Winter	3.877	0.0	275.8	246
480 min Winter	3.179	0.0	301.8	314
600 min Winter	2.725	0.0	323.6	380
720 min Winter	2.403	0.0	342.6	446
960 min Winter	1.972	0.0	374.8	572
1440 min Winter	1.492	0.0	424.9	820
2160 min Winter	1.128	0.0	487.0	1188
2880 min Winter	0.925	0.0	532.1	1556
4320 min Winter	0.700	0.0	602.0	2288
5760 min Winter	0.575	0.0	664.6	3000
7200 min Winter	0.492	0.0	711.2	3744
8640 min Winter	0.433	0.0	750.0	4496
10080 min Winter	0.389	0.0	783.3	5224

PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature A 1 year	
Date 07/12/2020 15:44 File Basin M.srcx	Designed by DAB Checked by MWS	
XP Solutions		Source Control 2019.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.438

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.360	4 8	0.360	8 12	0.360	12 16	0.358

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature A 1 year	
Date 07/12/2020 15:44 File Basin M.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 19.500

Tank or Pond Structure

Invert Level (m) 18.300

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	795.9	0.401	989.2	0.801	1198.5	1.200	1423.4
0.101	842.7	0.501	1040.0	0.901	1253.4		
0.201	890.5	0.601	1091.8	1.001	1309.2		
0.301	939.4	0.701	1144.7	1.101	1366.1		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0189-1770-0900-1770
Design Head (m)	0.900
Design Flow (l/s)	17.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	189
Invert Level (m)	18.300
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	17.7
Flush-Flo™	0.318	17.7
Kick-Flo®	0.660	15.3
Mean Flow over Head Range	-	14.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.6	1.200	20.3	3.000	31.4	7.000	47.3
0.200	17.0	1.400	21.8	3.500	33.9	7.500	48.9
0.300	17.7	1.600	23.2	4.000	36.1	8.000	50.5
0.400	17.5	1.800	24.6	4.500	38.2	8.500	52.0
0.500	17.1	2.000	25.9	5.000	40.2	9.000	53.5
0.600	16.3	2.200	27.1	5.500	42.1	9.500	54.7
0.800	16.7	2.400	28.2	6.000	43.9		
1.000	18.6	2.600	29.3	6.500	45.7		

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature A 100yr + 40%CC			
Date 07/12/2020 15:45 File Basin M.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.687	0.387	17.7	343.1	O K
30 min Summer	18.799	0.499	17.7	457.1	O K
60 min Summer	18.910	0.610	17.7	575.3	O K
120 min Summer	18.951	0.651	17.7	620.9	O K
180 min Summer	18.964	0.664	17.7	635.5	O K
240 min Summer	18.965	0.665	17.7	636.3	O K
360 min Summer	18.950	0.650	17.7	619.1	O K
480 min Summer	18.933	0.633	17.7	600.6	O K
600 min Summer	18.917	0.617	17.7	582.6	O K
720 min Summer	18.900	0.600	17.7	564.5	O K
960 min Summer	18.867	0.567	17.7	528.2	O K
1440 min Summer	18.803	0.503	17.7	460.8	O K
2160 min Summer	18.717	0.417	17.7	373.3	O K
2880 min Summer	18.647	0.347	17.7	304.6	O K
4320 min Summer	18.552	0.252	17.5	215.9	O K
5760 min Summer	18.502	0.202	17.1	170.5	O K
7200 min Summer	18.481	0.181	15.7	151.9	O K
8640 min Summer	18.468	0.168	14.5	140.7	O K
10080 min Summer	18.459	0.159	13.6	132.6	O K
15 min Winter	18.730	0.430	17.7	386.1	O K
30 min Winter	18.855	0.555	17.7	515.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	351.7	29	
30 min Summer	90.183	0.0	474.3	43	
60 min Summer	57.866	0.0	618.6	72	
120 min Summer	32.885	0.0	703.5	128	
180 min Summer	23.621	0.0	758.3	186	
240 min Summer	18.682	0.0	799.8	242	
360 min Summer	13.435	0.0	862.9	322	
480 min Summer	10.653	0.0	912.4	380	
600 min Summer	8.910	0.0	954.0	438	
720 min Summer	7.706	0.0	990.1	504	
960 min Summer	6.140	0.0	1051.7	638	
1440 min Summer	4.483	0.0	1151.1	904	
2160 min Summer	3.294	0.0	1275.3	1284	
2880 min Summer	2.663	0.0	1374.5	1648	
4320 min Summer	2.002	0.0	1546.7	2336	
5760 min Summer	1.655	0.0	1711.0	3000	
7200 min Summer	1.442	0.0	1863.2	3688	
8640 min Summer	1.297	0.0	2011.0	4416	
10080 min Summer	1.193	0.0	2155.2	5144	
15 min Winter	134.447	0.0	394.8	29	
30 min Winter	90.183	0.0	532.0	43	
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PFA Consulting Ltd				Page 2	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature A 100yr + 40%CC			
Date 07/12/2020 15:45 File Basin M.srcx		Designed by DAB Checked by MWS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	18.977	0.677	17.7	650.2	O K
120 min Winter	19.025	0.725	17.7	704.5	O K
180 min Winter	19.041	0.741	17.7	723.6	O K
240 min Winter	19.045	0.745	17.7	727.6	O K
360 min Winter	19.033	0.733	17.7	714.1	O K
480 min Winter	19.011	0.711	17.7	688.8	O K
600 min Winter	18.992	0.692	17.7	666.4	O K
720 min Winter	18.970	0.670	17.7	642.0	O K
960 min Winter	18.920	0.620	17.7	585.9	O K
1440 min Winter	18.820	0.520	17.7	478.4	O K
2160 min Winter	18.686	0.386	17.7	342.0	O K
2880 min Winter	18.583	0.283	17.6	244.4	O K
4320 min Winter	18.487	0.187	16.3	157.2	O K
5760 min Winter	18.461	0.161	13.7	134.1	O K
7200 min Winter	18.446	0.146	12.1	121.1	O K
8640 min Winter	18.436	0.136	10.9	112.7	O K
10080 min Winter	18.429	0.129	10.1	106.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	693.2	72	
120 min Winter	32.885	0.0	788.4	126	
180 min Winter	23.621	0.0	849.7	184	
240 min Winter	18.682	0.0	896.2	240	
360 min Winter	13.435	0.0	966.9	348	
480 min Winter	10.653	0.0	1022.4	438	
600 min Winter	8.910	0.0	1068.8	476	
720 min Winter	7.706	0.0	1109.3	554	
960 min Winter	6.140	0.0	1178.3	700	
1440 min Winter	4.483	0.0	1289.9	978	
2160 min Winter	3.294	0.0	1428.7	1356	
2880 min Winter	2.663	0.0	1540.0	1696	
4320 min Winter	2.002	0.0	1733.5	2296	
5760 min Winter	1.655	0.0	1916.7	3000	
7200 min Winter	1.442	0.0	2087.2	3744	
8640 min Winter	1.297	0.0	2252.9	4416	
10080 min Winter	1.193	0.0	2415.2	5144	
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PFA Consulting Ltd		Page 3																																																
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature A 100yr + 40%CC																																																	
Date 07/12/2020 15:45 File Basin M.srcx	Designed by DAB Checked by MWS																																																	
XP Solutions																																																		
Source Control 2019.1																																																		
<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FEH</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>FEH Rainfall Version</td> <td>2013</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>Site Location</td> <td>GB 448927 117350</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Data Type</td> <td>Point</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 1.438 <table> <thead> <tr> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> </tr> </thead> <tbody> <tr> <td>0 4</td> <td>0.360</td> <td>4 8</td> <td>0.360</td> <td>8 12</td> <td>0.360</td> <td>12 16</td> <td>0.358</td> </tr> </tbody> </table>			Rainfall Model	FEH	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	0.750	FEH Rainfall Version	2013	Cv (Winter)	0.840	Site Location	GB 448927 117350	Shortest Storm (mins)	15	Data Type	Point	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	0 4	0.360	4 8	0.360	8 12	0.360	12 16	0.358
Rainfall Model	FEH	Winter Storms	Yes																																															
Return Period (years)	100	Cv (Summer)	0.750																																															
FEH Rainfall Version	2013	Cv (Winter)	0.840																																															
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Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area																																											
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)																																											
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PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature A 100yr + 40%CC	
Date 07/12/2020 15:45 File Basin M.srcx	Designed by DAB Checked by MWS	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 19.500

Tank or Pond Structure

Invert Level (m) 18.300

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	795.9	0.401	989.2	0.801	1198.5	1.200	1423.4
0.101	842.7	0.501	1040.0	0.901	1253.4		
0.201	890.5	0.601	1091.8	1.001	1309.2		
0.301	939.4	0.701	1144.7	1.101	1366.1		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0189-1770-0900-1770
Design Head (m)	0.900
Design Flow (l/s)	17.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	189
Invert Level (m)	18.300
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	17.7
Flush-Flo™	0.318	17.7
Kick-Flo®	0.660	15.3
Mean Flow over Head Range	-	14.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.6	1.200	20.3	3.000	31.4	7.000	47.3
0.200	17.0	1.400	21.8	3.500	33.9	7.500	48.9
0.300	17.7	1.600	23.2	4.000	36.1	8.000	50.5
0.400	17.5	1.800	24.6	4.500	38.2	8.500	52.0
0.500	17.1	2.000	25.9	5.000	40.2	9.000	53.5
0.600	16.3	2.200	27.1	5.500	42.1	9.500	54.7
0.800	16.7	2.400	28.2	6.000	43.9		
1.000	18.6	2.600	29.3	6.500	45.7		

PFA Consulting Ltd				Page 1	
Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature N 1 year			
Date 07/12/2020 16:38 File Basin N.srcx		Designed by DAB Checked by MWs			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	17.190	0.090	7.3	201.6	O K
30 min Summer	17.217	0.117	11.8	262.5	O K
60 min Summer	17.244	0.144	17.1	326.1	O K
120 min Summer	17.267	0.167	22.0	379.9	O K
180 min Summer	17.278	0.178	24.4	405.0	O K
240 min Summer	17.285	0.185	26.1	422.6	O K
360 min Summer	17.292	0.192	27.7	440.2	O K
480 min Summer	17.296	0.196	28.4	447.7	O K
600 min Summer	17.296	0.196	28.6	449.7	O K
720 min Summer	17.296	0.196	28.4	448.6	O K
960 min Summer	17.293	0.193	27.8	441.4	O K
1440 min Summer	17.284	0.184	25.9	421.1	O K
2160 min Summer	17.271	0.171	23.0	390.4	O K
2880 min Summer	17.261	0.161	20.7	365.1	O K
4320 min Summer	17.245	0.145	17.3	327.7	O K
5760 min Summer	17.233	0.133	14.9	301.0	O K
7200 min Summer	17.224	0.124	13.2	280.8	O K
8640 min Summer	17.217	0.117	11.9	264.3	O K
10080 min Summer	17.212	0.112	10.9	250.8	O K
15 min Winter	17.200	0.100	8.9	225.4	O K
30 min Winter	17.230	0.130	14.3	293.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	29.494	0.0	160.5	30	
30 min Summer	19.618	0.0	225.5	42	
60 min Summer	12.728	0.0	329.8	68	
120 min Summer	8.110	0.0	426.8	120	
180 min Summer	6.206	0.0	493.4	146	
240 min Summer	5.126	0.0	545.8	178	
360 min Summer	3.877	0.0	622.0	244	
480 min Summer	3.179	0.0	681.8	312	
600 min Summer	2.725	0.0	731.8	378	
720 min Summer	2.403	0.0	775.1	444	
960 min Summer	1.972	0.0	848.2	574	
1440 min Summer	1.492	0.0	960.5	826	
2160 min Summer	1.128	0.0	1119.6	1196	
2880 min Summer	0.925	0.0	1222.5	1564	
4320 min Summer	0.700	0.0	1377.2	2296	
5760 min Summer	0.575	0.0	1536.9	3008	
7200 min Summer	0.492	0.0	1643.4	3752	
8640 min Summer	0.433	0.0	1730.5	4496	
10080 min Summer	0.389	0.0	1801.6	5240	
15 min Winter	29.494	0.0	184.1	29	
30 min Winter	19.618	0.0	257.3	42	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature N 1 year			
Date 07/12/2020 16:38 File Basin N.srcx		Designed by DAB Checked by MWs			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	17.260	0.160	20.6	364.0	O K
120 min Winter	17.286	0.186	26.2	424.2	O K
180 min Winter	17.296	0.196	28.6	449.8	O K
240 min Winter	17.303	0.203	30.1	466.3	O K
360 min Winter	17.308	0.208	31.1	476.9	O K
480 min Winter	17.308	0.208	31.1	476.4	O K
600 min Winter	17.305	0.205	30.6	470.9	O K
720 min Winter	17.302	0.202	29.9	463.2	O K
960 min Winter	17.295	0.195	28.2	445.3	O K
1440 min Winter	17.280	0.180	24.9	410.5	O K
2160 min Winter	17.262	0.162	21.0	368.3	O K
2880 min Winter	17.249	0.149	18.1	337.0	O K
4320 min Winter	17.230	0.130	14.4	294.6	O K
5760 min Winter	17.218	0.118	12.1	266.6	O K
7200 min Winter	17.209	0.109	10.4	246.0	O K
8640 min Winter	17.202	0.102	9.3	230.1	O K
10080 min Winter	17.197	0.097	8.4	217.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	12.728	0.0	372.4	68	
120 min Winter	8.110	0.0	481.2	118	
180 min Winter	6.206	0.0	555.8	150	
240 min Winter	5.126	0.0	614.6	186	
360 min Winter	3.877	0.0	700.1	260	
480 min Winter	3.179	0.0	767.1	332	
600 min Winter	2.725	0.0	823.2	402	
720 min Winter	2.403	0.0	871.9	470	
960 min Winter	1.972	0.0	954.0	602	
1440 min Winter	1.492	0.0	1080.6	860	
2160 min Winter	1.128	0.0	1256.2	1236	
2880 min Winter	0.925	0.0	1371.9	1600	
4320 min Winter	0.700	0.0	1546.9	2344	
5760 min Winter	0.575	0.0	1722.9	3064	
7200 min Winter	0.492	0.0	1842.5	3824	
8640 min Winter	0.433	0.0	1940.9	4576	
10080 min Winter	0.389	0.0	2022.7	5256	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature N 1 year	
Date 07/12/2020 16:38 File Basin N.srcx	Designed by DAB Checked by MWs	
XP Solutions	Source Control 2019.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 3.743

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.935	4 8 0.935	8 12 0.935	12 16 0.938				

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	From: To: (ha)
0 4 0.000	

PFA Consulting Ltd		Page 4
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature N 1 year	
Date 07/12/2020 16:38 File Basin N.srcx	Designed by DAB Checked by MWs	
XP Solutions	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 18.300

Tank or Pond Structure

Invert Level (m) 17.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	2197.7	0.401	2579.3	0.801	2976.7	1.200	3388.8
0.101	2291.7	0.501	2677.2	0.901	3078.5		
0.201	2386.6	0.601	2776.0	1.001	3181.3		
0.301	2482.5	0.701	2875.8	1.101	3285.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0285-4610-0900-4610
Design Head (m)	0.900
Design Flow (l/s)	46.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	285
Invert Level (m)	17.100
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	46.1
Flush-Flo™	0.426	46.0
Kick-Flo®	0.721	41.4
Mean Flow over Head Range	-	36.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.9	1.200	52.9	3.000	82.5	7.000	124.7
0.200	29.4	1.400	57.0	3.500	88.9	7.500	128.9
0.300	44.8	1.600	60.8	4.000	94.9	8.000	133.1
0.400	46.0	1.800	64.4	4.500	100.5	8.500	137.1
0.500	45.7	2.000	67.7	5.000	105.8	9.000	141.0
0.600	44.6	2.200	70.9	5.500	110.8	9.500	143.8
0.800	43.5	2.400	74.0	6.000	115.6		
1.000	48.5	2.600	76.9	6.500	120.2		

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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature N 100yr + 40%CC			
Date 07/12/2020 16:39 File Basin N.srcx		Designed by DAB Checked by MWs			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	17.479	0.379	45.9	899.6	O K
30 min Summer	17.592	0.492	46.0	1195.6	O K
60 min Summer	17.705	0.605	46.0	1504.6	O K
120 min Summer	17.750	0.650	46.0	1628.8	O K
180 min Summer	17.765	0.665	46.0	1671.6	O K
240 min Summer	17.767	0.667	46.0	1678.8	O K
360 min Summer	17.758	0.658	46.0	1651.6	O K
480 min Summer	17.747	0.647	46.0	1622.1	O K
600 min Summer	17.736	0.636	46.0	1590.1	O K
720 min Summer	17.723	0.623	46.0	1555.2	O K
960 min Summer	17.696	0.596	46.0	1479.4	O K
1440 min Summer	17.641	0.541	46.0	1326.5	O K
2160 min Summer	17.563	0.463	46.0	1118.7	O K
2880 min Summer	17.500	0.400	46.0	953.8	O K
4320 min Summer	17.414	0.314	45.1	737.4	O K
5760 min Summer	17.370	0.270	43.5	626.7	O K
7200 min Summer	17.348	0.248	39.5	573.4	O K
8640 min Summer	17.333	0.233	36.6	536.6	O K
10080 min Summer	17.322	0.222	34.4	511.0	O K
15 min Winter	17.522	0.422	46.0	1010.9	O K
30 min Winter	17.648	0.548	46.0	1346.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.447	0.0	881.1	29	
30 min Summer	90.183	0.0	1197.1	43	
60 min Summer	57.866	0.0	1591.4	72	
120 min Summer	32.885	0.0	1811.8	128	
180 min Summer	23.621	0.0	1953.6	184	
240 min Summer	18.682	0.0	2061.2	242	
360 min Summer	13.435	0.0	2224.5	310	
480 min Summer	10.653	0.0	2352.5	370	
600 min Summer	8.910	0.0	2459.6	434	
720 min Summer	7.706	0.0	2552.8	500	
960 min Summer	6.140	0.0	2711.1	634	
1440 min Summer	4.483	0.0	2965.2	900	
2160 min Summer	3.294	0.0	3307.2	1284	
2880 min Summer	2.663	0.0	3563.4	1648	
4320 min Summer	2.002	0.0	4002.1	2340	
5760 min Summer	1.655	0.0	4446.3	3008	
7200 min Summer	1.442	0.0	4840.3	3744	
8640 min Summer	1.297	0.0	5221.3	4424	
10080 min Summer	1.193	0.0	5588.5	5152	
15 min Winter	134.447	0.0	992.4	29	
30 min Winter	90.183	0.0	1345.8	43	
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Stratton Park House Wanborough Road Swindon SN3 4HG		G277-One Horton Heath Strategic SuDS Feature N 100yr + 40%CC			
Date 07/12/2020 16:39 File Basin N.srcx		Designed by DAB Checked by MWs			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	17.774	0.674	46.0	1698.0	O K
120 min Winter	17.826	0.726	46.0	1848.0	O K
180 min Winter	17.846	0.746	46.0	1906.2	O K
240 min Winter	17.852	0.752	46.0	1924.3	O K
360 min Winter	17.845	0.745	46.0	1902.4	O K
480 min Winter	17.826	0.726	46.0	1847.9	O K
600 min Winter	17.809	0.709	46.0	1798.7	O K
720 min Winter	17.790	0.690	46.0	1743.6	O K
960 min Winter	17.747	0.647	46.0	1622.1	O K
1440 min Winter	17.658	0.558	46.0	1375.5	O K
2160 min Winter	17.538	0.438	46.0	1052.1	O K
2880 min Winter	17.446	0.346	45.6	816.9	O K
4320 min Winter	17.358	0.258	41.4	598.1	O K
5760 min Winter	17.326	0.226	35.2	521.4	O K
7200 min Winter	17.308	0.208	31.1	476.2	O K
8640 min Winter	17.294	0.194	28.1	445.0	O K
10080 min Winter	17.285	0.185	26.0	422.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	57.866	0.0	1785.3	72	
120 min Winter	32.885	0.0	2032.1	128	
180 min Winter	23.621	0.0	2190.9	184	
240 min Winter	18.682	0.0	2311.4	240	
360 min Winter	13.435	0.0	2494.2	348	
480 min Winter	10.653	0.0	2637.5	412	
600 min Winter	8.910	0.0	2757.5	472	
720 min Winter	7.706	0.0	2862.0	548	
960 min Winter	6.140	0.0	3039.5	694	
1440 min Winter	4.483	0.0	3324.8	974	
2160 min Winter	3.294	0.0	3706.6	1352	
2880 min Winter	2.663	0.0	3994.1	1700	
4320 min Winter	2.002	0.0	4488.3	2336	
5760 min Winter	1.655	0.0	4981.5	3056	
7200 min Winter	1.442	0.0	5423.4	3752	
8640 min Winter	1.297	0.0	5851.4	4496	
10080 min Winter	1.193	0.0	6266.3	5240	
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PFA Consulting Ltd		Page 3
Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature N 100yr + 40%CC	
Date 07/12/2020 16:39 File Basin N.srcx	Designed by DAB Checked by MWs	
XP Solutions		
Source Control 2019.1		

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 448927 117350	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 3.743

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.935	4 8 0.935	8 12 0.935	12 16 0.938				

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	From: To: (ha)
0 4 0.000	

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Stratton Park House Wanborough Road Swindon SN3 4HG	G277-One Horton Heath Strategic SuDS Feature N 100yr + 40%CC	
Date 07/12/2020 16:39 File Basin N.srcx	Designed by DAB Checked by MWs	
XP Solutions Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 18.300

Tank or Pond Structure

Invert Level (m) 17.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	2197.7	0.401	2579.3	0.801	2976.7	1.200	3388.8
0.101	2291.7	0.501	2677.2	0.901	3078.5		
0.201	2386.6	0.601	2776.0	1.001	3181.3		
0.301	2482.5	0.701	2875.8	1.101	3285.0		

Hydro-Brake® Optimum Outflow Control

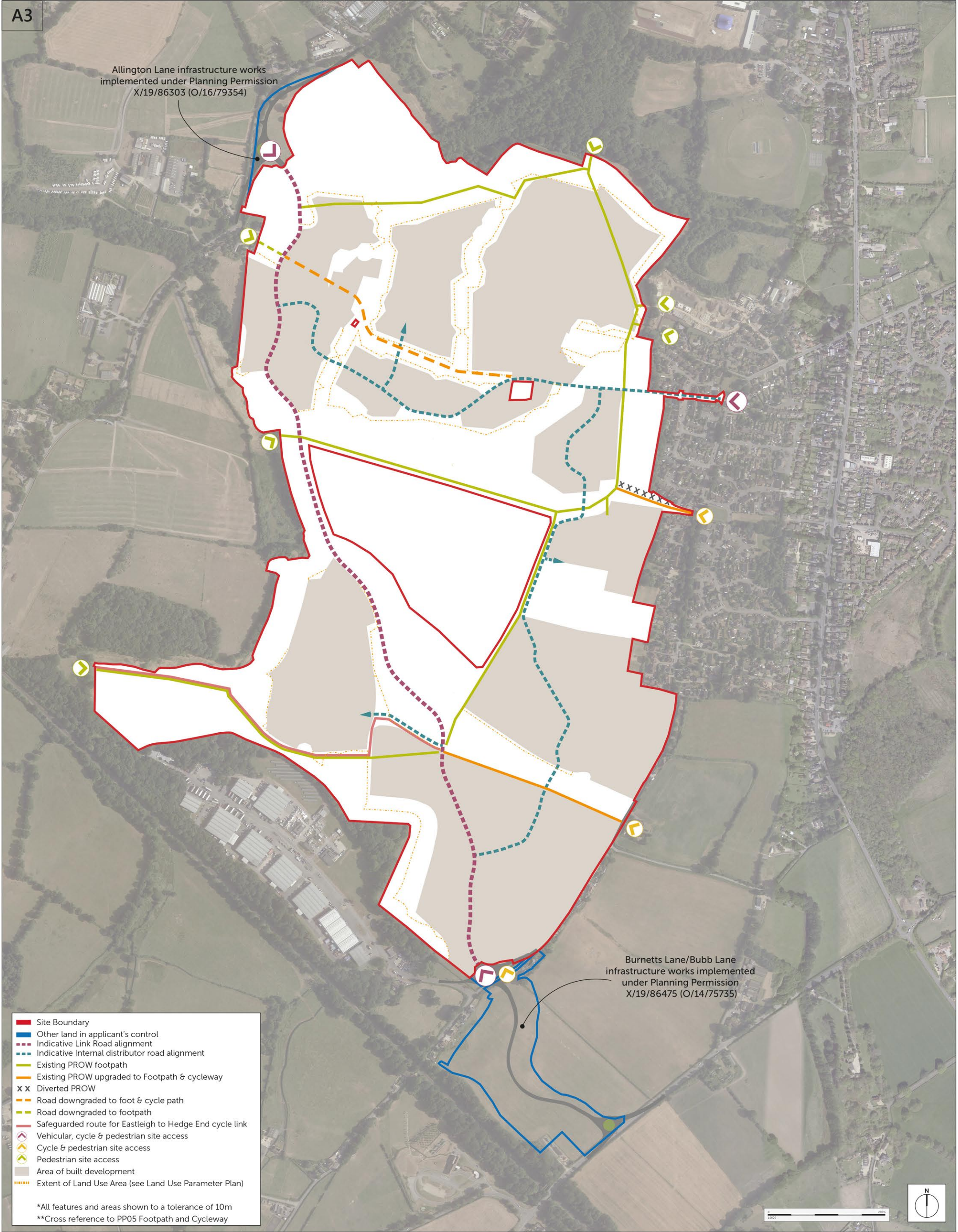
Unit Reference	MD-SHE-0285-4610-0900-4610
Design Head (m)	0.900
Design Flow (l/s)	46.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	285
Invert Level (m)	17.100
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	46.1
Flush-Flo™	0.426	46.0
Kick-Flo®	0.721	41.4
Mean Flow over Head Range	-	36.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.9	1.200	52.9	3.000	82.5	7.000	124.7
0.200	29.4	1.400	57.0	3.500	88.9	7.500	128.9
0.300	44.8	1.600	60.8	4.000	94.9	8.000	133.1
0.400	46.0	1.800	64.4	4.500	100.5	8.500	137.1
0.500	45.7	2.000	67.7	5.000	105.8	9.000	141.0
0.600	44.6	2.200	70.9	5.500	110.8	9.500	143.8
0.800	43.5	2.400	74.0	6.000	115.6		
1.000	48.5	2.600	76.9	6.500	120.2		

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From: [FWM Statutory SWM Consultee mailbox](#)
To: [Mark Skivington](#)
Cc: [FWM Statutory SWM Consultee mailbox](#)
Subject: RE: G277 - One Horton Heath - 14/01/2020 Meeting with LLFA
Date: 02 March 2020 12:26:50

Dear Mr Skivington,

Thank you for your email.

I confirm that I agree with the submitted minutes.

Kind regards,
Santi

Santiago Manzanero
Flood and Water Management Engineer
01962 846777
Santi.Manzanero@hants.gov.uk

Economy Transport and Environment
EII Court West
The Castle
Winchester
Hampshire
SO23 8UD



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www.hants.gov.uk/sharedexpertise

The HCC Flood and Water Management team offer a Flood and Water Management information service for Local Authorities and developers offering both historic site information and a full Pre-Application assessment of a proposed development's Surface Water Drainage features. For specific information please visit the '[Reducing flood risk in planning](#)' webpage or for general information see [HCC Flood & Water Management](#)

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From: Mark Skivington <mskivington@pfapl.com>
Sent: 25 February 2020 15:58
To: FWM Statutory SWM Consultee mailbox <SWM.Consultee@hants.gov.uk>
Cc: 'Cranmer, David' <David.Cranmer@eastleigh.gov.uk>; smillard@pfapl.com
Subject: G277 - One Horton Heath - 14/01/2020 Meeting with LLFA

Dear Santiago,

Thank you for taking the time to meet with us at your offices last month. I believe that the

following provides a summary of the discussions in relation to the outline planning application.

Broad agreement of the surface water drainage strategy as shown on drawing G277/9 Rev A (attached). HCC confirmed that, for an Outline Application of this scale, Micro Drainage Source Control modelling outputs would be suitable to demonstrate that the proposed strategic SuDS features provide the required attenuation.

Strategic SuDS features to incorporate a series of treatment processes, i.e. sediment forebays, micropools, low flow channels, wetland planting areas and swales for outfalls where possible. Upstream Source Control and green infrastructure measures to be covered by text within drainage strategy / Flood Risk Assessment reports to inform later detailed designs.

Agreement that BGS borehole logs and other evidence is suitable to demonstrate that infiltration drainage is not feasible. If information on groundwater levels is not available SuDS features may need to be clay lined to prevent ingress.

Due to the lack of potential for infiltration drainage it will not be feasible to reduce post-development runoff volumes to the greenfield volume. HCC confirmed that they would accept flow rates for events up to the 1 in 100year + 40% being restricted to Q_{bar}/Q_{med} as an alternative. The SuDS features shown on G277/9 Rev A have been sized on this basis.

Catchments draining to strategic SuDS features should replicate natural catchments as closely as possible.

HCC to provide guidance on offsets from Ordinary Watercourses. It was mentioned in the meeting that the appropriate offsets are thought to be 8 metres for Main Rivers (EA) and 5 metres for Ordinary Watercourses. HCC to confirm.

PFA to provide Greenfield Runoff calculations for approval by HCC. A Technical Note setting out the Greenfield Runoff calculations is attached.

Please could you confirm that you agree that the above is a fair reflection of our discussions and please let me know if you have any further comments.

Kind regards,

Mark Skivington

Associate Designate

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SN3 4HG

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This document should be read in conjunction with the Surface Water Checklist Guidance document located on our website

SURFACE WATER SUBMITTED INFORMATION

Some applications have a considerable number of documents associated with them. To make sure we are reviewing the correct documentation, please ensure the following table is completed.

Document / Drawing Title	Document / Drawing Reference (and revision)
PFA Consulting's: One Horton Heath, Eastleigh – Flood Risk Assessment	G277-DOC01 Issue 1 & Appendices

PRE-APPLICATION / PREVIOUS PLANNING APPLICATIONS

If this site was subject to a previous planning application i.e. an outline application in relation to a wider strategic site, pre-application enquiry or if you are reliant on information previously submitted, please provide the relevant reference numbers below.

Planning / Pre-app Titles	Reference Number
Pre-application meeting and follow up emails.	Meeting date: 14/01/2020 with Santiago Manzanero

ORDINARY WATERCOURSE CONSENTING – to be completed and signed by the applicant

I confirm that I have reviewed the site and there are watercourses / ditches / flow routes that will be affected or amended by the works. I understand that these works require Ordinary Watercourse Consent under the Land Drainage Act 1991 and confirm that applications will be made for these works prior to works starting on site.

Name:..... **Job Title:**.....

Signature:.....

SURFACE WATER CHECKLIST

Site Name		Planning ref			
Ref	SURFACE WATER REQUIREMENTS	PLANNING STAGE		SUBMISSION CHECKLIST	
		OUTLINE PLANNING	DETAILED PLANNING	Included Yes/Not	DOCUMENT Ref
	EXISTING INFORMATION	X	X		
1	Topographical Survey.	X	X	Yes	Mayer Brown IR SAV 1.21 Rev E
2	Existing Drainage	X	X	Yes	PFA dwg G277/20
3	Discharge Rates and Volumes	X	X	Yes	FRA
4	Existing Overland Flow Paths	X	X	Yes	PFA dwg G277/20
5	Site Investigations	X	X	Yes	Hydrock Doc ref: HHD-HYD-XX-XX-RP-GE-0002
	OUTLINE DRAINAGE STRATEGY				
6	Confirmation of a discharge location	X	X	Yes	PFA dwg G277/21&22
7	Outline Surface Water Calculations	X		Yes	FRA
8	Flood Risk Assessment / Drainage Strategy	X	X	Yes	FRA
9	Potential Flood Risk	X	X	Yes	FRA
10	Outline Drainage Layout Plan	X		Yes	PFA dwg G277/21,22&23
	DETAILED DRAINAGE STRATEGY		X		
11	Detailed Drainage Assessment		X		
12	Detailed Drainage Layout Drawings		X		
13	Detailed Hydraulic Calculations		X		
14	Water Treatment		X		
15	Exceedance Flows		X		
16	Urban Creep		X		
17	Maintenance		X		